

II B. Tech II Semester Regular Examinations, May/June – 2015
HYDRAULICS AND HYDRAULIC MACHINERY
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**
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PART-A

1. a) Differentiate between uniform and non uniform flow
- b) What are the methods of dimensional analysis?
- c) Differentiate between inward and outward radial flow turbine
- d) How cavitations be avoided in reaction turbine
- e) Define slip, percentage slip and negative slip of a reciprocating pump.
- f) Define the term utilization factor

(3M+4M+4M+4M+4M+3M)

PART-B

2. a) Obtain an expression for the depth after the hydraulic jump and the loss of head
 Due to the jump. Write the assumptions made.
- b) Determine the economical cross-section for an open channel of trapezoidal section with side slopes of 1 vertical to 2 horizontal, to carry $10 \text{ m}^3/\text{s}$, the bed slope being $1/2000$. Assume Manning coefficient as 0.022. (8M+8M)
3. a) What do you mean by dimensional numbers? Name any four dimensional numbers. Define and explain Reynolds's number, Froude's number and Mach number. Derive expressions for any above two numbers.
- b) What is meant by geometric, kinematic and dynamic similarities? (10M+6M)



4. a) A water jet 20 mm in diameter and having a velocity of 90 m/s strikes series of moving blades in a wheel. The direction of the jet makes 20° with the direction of movement of the blade. The blade angle at inlet is 35° . If the jet should enter the blade without striking, what should be the blade velocity? If the outlet angle of the blade is 30° , determine the force on the blade. Assume that there is no friction involved in the flow over the blade.
- b) Differentiate between the force exerted by a jet on a single curved moving plate and a series of curved moving plate (10M+6M)
5. a) A Francis turbine working under a head of 5 m at a speed of 210 rpm develops 75 KW when the rate of flow of water is 1.8 m³/ sec. If the head is increased to 16 m, determine the speed, discharge and power.
- b) Explain briefly the principles on which a Kaplan turbine works. (9M+7M)
6. a) A centrifugal pump works against a head of 30 m and discharges 0.25 m³/s while running at 1000 rpm. The velocity of flow at the outlet is 3 m/s and the vane angle at outlet is 30° . Determine the diameter and width of impeller at outlet if the hydraulic efficiency is 80 per cent.
- b) Draw and discuss the operating characteristics of a centrifugal pump (9M+7M)
7. Write short notes on the following:
- i) Firm Power ii) Secondary power iii) Utilization factor iv) Load duration curve. (4M+4M+4M+4M)



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**PART-A**

1. a) Differentiate between Steady and unsteady flow
- b) What do you mean by repeating variable?
- c) Differentiate between the radial and axial flow turbines
- d) Define and explain hydraulic efficiency and mechanical efficiency
- e) What is an air vessel?
- f) What do you mean by mass curve?

(3M+4M+4M+3M+4M+4M)

**PART-B**

2. a) Derive the condition for depth of flow of a most economical circular channel  
 Section subject to the condition for maximum velocity.
- b) A Wide channel of uniform rectangular section with a slope of 1/95 has a flow rate of 3.75 m<sup>3</sup>/s/m. The Manning constant is 0.013. Suddenly the slope changes to 1/1420. Determine the normal depths for each case. Show that a hydraulic jump has to occur and calculate the downstream flow height. (8M+8M)
3. a) What are the methods of dimensional analysis? Describe the Rayleigh's method for Dimensional analysis.
- b) Explain the terms: distorted models and undistorted models. What the use is of distorted Models? (8M+8M)



4. a) Prove that the force exerted by a jet of water on a fixed semi-circular plate in the direction of the jet when the jet strikes at the center of the semi-circular plate is two times the force exerted by the jet on an fixed vertical plate.
- b) Find the force exerted by a jet of water of diameter 100 mm on a stationary flat plate, when the jet strikes the plate normally with a velocity of 30 m/s. (8M+8M)
5. a) Define the specific speed of the turbine? Derive an expression for the specific speed. What is the significance of specific speed of the turbine.
- b) Two jets strike at bucket of a Pelton wheel, which is having shaft power as 14,715 kW. The diameter of each jet is given as 150 mm. If the net head on the turbine is 500 m, find the overall efficiency of the turbine. Take  $C_v = 1.0$  (8M+8M)
6. a) The diameter and width of a centrifugal pump impeller are 50 cm and 2.5 cm. The pump runs at 1200 rpm. The suction head is 6 m and the delivery head is 40m. The frictional drop in suction is 2 m and in the delivery 8 m. The blade angle at out let is  $30^\circ$ . The manometric efficiency is 80% and the overall efficiency is 75%. Determine the power required to drive the pump. Also calculate the pressures at the suction and delivery side of the pump
- b) Define a centrifugal pump. Explain the working of a single stage centrifugal pump with neat sketches. (9M+7M)
7. a) How do you estimate hydropower potential
- b) Discuss various classifications of different types of hydropower plants (9M+7M)



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**PART-A**

1. a) What is specific energy curve  
 b) State Buckingham's  $\pi$ - theorem  
 c) Differentiate between the impulse and reaction turbine  
 d) Define the terms 'unit power', 'unit speed' and 'unit discharge'  
 e) Differentiate between a single acting and double acting reciprocating pump  
 f) What is a draft tube? What are its functions? (3M+4M+3M+4M+4M+4M)

**PART-B**

2. a) Explain the terms specific energy of a flowing liquid, minimum specific energy, critical depth, critical velocity and alternate depths as applied to non-uniform flow.  
 b) A rectangular channel of 5 m width discharges water at the rate of  $1.5 \text{ m}^3/\text{s}$  into a 5 m wide apron with  $1/3000$  slope at a velocity of 5 m/s. Determine the height of the hydraulic jump and energy loss. (8M+8M)
3. a) Explain different types of hydraulic similarities that must exist between a prototype and its model.  
 b) Define the term dimensional analysis and model analysis (10M+6M)
4. a) A jet of water of diameter 50 mm moving with a velocity of 20 m/s strikes a fixed plate in such a way that the angle between the jet and the plate is  $60^\circ$ . Find the force exerted by the jet on the plate (i) in the direction normal to the plate, and (ii) in the direction of the jet.  
 b) Differentiate between the force exerted by a jet of water on a fixed vertical plate and moving vertical plate. (10M+6M)
5. a) A Kaplan turbine is to develop 2400 KW when running at 240 rpm under a net head of 49m. In order to predict its performance a model of scale 1:5 is tested under a net head of 25m. At what speed should the model run and what power would it develop. Determine the discharge in the model and in full scale turbine if the overall efficiency of the model is 85%  
 b) Explain the different types of the efficiency of a turbine (9M+7M)
6. a) What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of centrifugal pump.  
 b) What is negative slip in a reciprocating pump? Explain with neat sketches the functions of air vessels in a reciprocating pump (8M+8M)
7. a) What are the main components of hydropower plants and explain each in detail  
 b) Define the terms: (i) load factor, (ii) utilization factor and (iii) capacity factor (9M+7M)



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**PART-A**

1. a) Differentiate between Critical, sub-critical and super –critical flow in a open channel  
 b) What do you mean by fundamental units and derived units? Give examples  
 c) Differentiate between the turbines and pumps  
 d) What is specific speed  
 e) Differentiate between a single cylinder and double cylinder reciprocating pump  
 f) Define the term load factor

(4M+4M+4M+3M+4M+3M)

**PART-B**

2. a) Derive the condition for the best side slope of the most economical trapezoidal channel.  
 b) Water is discharged at a velocity of 8 m/s with a depth of 0.7 m in a horizontal rectangular open channel of constant width when the sluice gate is opened upwards. Determine the height of the hydraulic jump and the loss of energy (8M+8M)
3. a) State Buckingham's  $\Pi$ -theorem. Why this theorem is considered superior over the Rayleigh's method for dimensional analysis.  
 b) What is meant by geometric, kinematic and dynamic similarities? (10M+6M)
4. a) Derive the expression for the force exerted by a water jet on a plate moving in the same direction of the jet with a velocity less than that of the jet.  
 b) A blade turns the jet of diameter 3 cm at a velocity of 20 m/s by  $60^\circ$ . Determine the force exerted by the blade on the fluid. (8M+8M)
5. a) A Pelton wheel is having a mean bucket diameter of 0.8 m and is running at 1000 r.p.m. The net head on the Pelton wheel is 400 m. If the side clearance angle is  $15^\circ$  and discharge through nozzle is 150 liters/s, find (i) Power available at the nozzle, and (ii) Hydraulic efficiency of the turbine  
 b) What do you understand by the characteristics curves of turbine? Name the important characteristics of a turbine. (9M+7M)
6. a) What is meant by priming of a centrifugal pump? What are the different priming arrangements employed for small and big pumping units?  
 b) Find an expression for the head lost due to friction in suction and delivery pipe (8M+8M)
7. a) Compare and contrast between hydropower station and thermal power station.  
 b) List out twelve important hydropower plants in India. (9M+7M)



**II B. Tech II Semester Regular Examinations, May/June – 2015**

**SWITCHING THEORY AND LOGIC DESIGN**

(Com. to EEE, ECE, ECC, EIE.)

Time: 3 hours

Max. Marks: 70

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**PART-A**

1. a) Represent +65 and -65 in sign magnitude, sign 1's complement and sign 2's Complement representation.
- b) Define prime implicant and essential prime implicants of a Boolean expression
- c) List the applications of Multiplexers.
- d) Implement the following Boolean function using PROM  
 $F_1(A_1, A_0) = \sum m(1, 2)$        $F_2(A_1, A_0) = \sum m(0, 1, 3)$
- e) Write the differences between combinational and sequential circuits.
- f) Sketch Mealy circuit and explain.

(4M+4M+3M+3M+4M+4M)

**PART - B**

2. Implement the following functions using NAND gates.
  - a)  $F_1 = A(B + CD) + (BC)'$
  - b)  $F_2 = wx' + x'y(z + w')$  (8M+8M)
3. Minimize the following function using K-map and also verify through tabulation method.  
 $F(A, B, C, D) = \sum m(1, 4, 5, 7, 8, 9, 12, 14) + d(0, 3, 6, 10)$  (16M)
4. a) Define decoder. Construct 3x8 decoder using logic gates and truth table.  
 b) Define an encoder. Design octal to binary encoder. (8M+8M)



5. a) Derive the PLA programming table for the combinational circuit that squares a 3 bit number.  
b) Implement the following Boolean functions using PAL.  
 $W(A, B, C, D) = \sum m(0, 2, 6, 7, 8, 9, 12, 13)$   
 $X(A, B, C, D) = \sum m(0, 2, 6, 7, 8, 9, 12, 13, 14)$   
 $Y(A, B, C, D) = \sum m(2, 3, 8, 9, 10, 12, 13)$   
 $Z(A, B, C, D) = \sum m(1, 3, 4, 6, 9, 12, 14)$  (8M+8M)
6. Convert the following  
a) JK flip-flop to T flip-flop  
b) RS flip-flop to D flip-flop (8M+8M)
7. A clocked sequential circuit is provided with a single input x and single output z, whenever the input produces a string pulsed 111 or 000 and at the end of the sequence it produces an output z=1 and overlapping is also allowed.  
a) Obtain state diagram and state table.  
b) Find equivalence classes using partition method and design the circuit using D flip-flop. (8M+8M)



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**PART-A**

1. a) Perform  $(24)_{10} - (56)_{10}$  in BCD using 9's complement
- b) State De Morgans's theorems.
- c) Design 2x4 decoder using NAND gates.
- d) Give the comparison between PROM, PLA and PAL.
- e) What are applications of Flip-Flop?
- f) Write capabilities and limitations of Finite- State machine.

(4M+3M+4M+4M+3M+4M)

**PART - B**

2. Find the complement of the following Boolean functions and reduce them to minimum number of literals.
  - a)  $(b^c + a^d)(ab^c + cd)$
  - b)  $(b^d + a^b c^d + a^b c)$  (8M+8M)
3. Simplify the following Boolean expressions using K-map and implement it by using NOR gates.
  - a)  $F(A,B,C,D) = AB^c C^d + AC + A^c D^d$
  - b)  $F(W,X,Y,Z) = w^x y^z + w x y^z + w^x y z + w x y z$  (8M+8M)
4. a) Design and implement a two bit comparator using logic gates.  
 b) Implement full adder using decoder and OR gates. (8M+8M)
5. a) Design a BCD to excess-3 code converter and implement using suitable PLA.  
 b) Implement the following functions using a PROM
  - i)  $F(w,x,y,z) = \sum(1,9,12,15)$
  - ii)  $G(w,x,y,z) = \sum(0,1,2,3,4,5,7,8,10,11,12,13,14,15)$  (8M+8M)



6. a) Draw the logic diagram of a JK flip- flop and using excitation table explain its operation.  
b) What do you mean by triggering? Explain the various triggering modes with examples.  
(8M+8M)
7. Find the equivalence partition and a corresponding reduced machine in a standard form for a given machine.

| PS | NS  | Z   |
|----|-----|-----|
|    | X=0 | X=1 |
| A  | B,0 | E,0 |
| B  | E,0 | D,0 |
| C  | D,1 | A,0 |
| D  | C,1 | E,0 |
| E  | B,0 | D,0 |
| F  | C,1 | C,1 |
| G  | C,1 | D,1 |
| H  | C,0 | A,1 |

(16M)



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**PART- A**

1. a) Convert  $(97.75)_{10}$  to base 2.  
 b) Prove that OR-AND network is equivalent to NOR-NOR network.  
 c) Realize full adder using two half adders and logic gates.  
 d) Design a 4x2 PROM with AND-OR gates.  
 e) Define the following terms of flip flop.  
     i) Hold time    ii) Setup time    iii) Propagation delay time  
 f) Distinguish between Moore and Mealy Machines.

(3M+4M+4M+3M+4M+4M)

**PART- B**

2. a) Convert the given expression in standard SOP form  
 $f(A,B,C)=AC+BA+BC$   
 b) Convert the given expression in standard POS form  
 $y=A.(A+B+C)$  (8M+8M)
3. a) Reduce the following function using k-map technique  
 $F(A,B,C,D)=\prod(0,2,3,8,9,12,13,15)$   
 b) Minimize the expression using k-map  
 $y=(A+B+C^1)(A+B+C)(A^1+B^1+C^1)(A^1+B+C)(A+B+C)$  (8M+8M)
4. a) Design BCD to gray code converter and realize using logic gates.  
 b) Design a 1:8 demultiplexer using two 1:4 demultiplexer. (8M+8M)
5. a) Implement the following Boolean functions using PLA.  
 $A(x,y,z)=\sum m(1,2,4,6)$   
 $B(x,y,z)=\sum m(0,1,6,7)$   
 $C(x,y,z)=\sum m(2,6)$   
 b) Design a combinational circuit using PROM that accepts 3-bit binary number and generates its equivalent excess-3 code. (8M+8M)



6. a) Draw the logic diagram of a SR latch using NOR gates. Explain its Operation using excitation table.

b) Convert D flip-flop into T and JK flip-flops.

(8M+8M)

7. a) Convert the following Mealy machine into a corresponding Moore Machine.

|       |         |         |
|-------|---------|---------|
| 8. PS | 9. NS   | a. Z    |
|       | 10. X=0 | 11. X=1 |
| 12. A | 13. C,0 | 14. B,0 |
| 15. B | 16. A,1 | 17. D,0 |
| 18. C | 19. B,1 | 20. A,1 |
| 21. D | 22. D,1 | 23. C,0 |

b) Convert the following Moore machine into a corresponding Melay Machine

| 24. PS | i. NEXT STATE |         | 25. OUTP<br>UT<br>26. Z |
|--------|---------------|---------|-------------------------|
|        | 27. X=0       | 28. X=1 |                         |
| 29. A  | 30. D         | 31. B   | 32. 0                   |
| 33. B  | 34. B         | 35. C   | 36. 1                   |
| 37. C  | 38. C         | 39. D   | 40. 0                   |
| 41. D  | 42. D         | 43. B   | 44. 0                   |

(8M+8M)



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**PART-A**

1. a) Convert  $(2468)_{10}$  to  $( )_{16}$   
 b) What are the advantages of tabulation method over K-map?  
 c) Implement the following functions using Demultiplexer.  
 $F_1(A,B,C) = \sum m(0,3,7)$      $F_2(A,B,C) = \sum m(1,2,5)$   
 d) Write a brief note on PLDs  
 e) Give the comparison between synchronous sequential and asynchronous sequential circuits  
 f) Draw and explain Moore circuit.

(3M+4M+4M+3M+4M+4M)

**PART – B**

2. a) Given the 8bit data word 01011011, generate the 12 bit composite word for the hamming code that corrects and detects single errors.  
 b) Perform the following addition using excess-3 code.  
 i)  $386+756$     ii)  $1010 + 444$  (10M+6M)
3. Simplify the following using tabulation method  
 $y(w,x,y,z) = \sum m(1,2,3,5,9,12,14,15) + d(4,8,11)$  (16M)
4. a) Design a excess-3 adder using 4-bit parallel binary adder and logic gates.  
 b) What are the applications of full adders? (12M+4M)



5. a) Illustrate how a PLA can be used for combinational logic design with reference to the functions

$$F_1(A,B,C)=\sum m(0,1,3,4) \quad F_2(A,B,C)=\sum m(1,2,3,4,5)$$

Realize the same assuming that a 3x4x2 PLA is available.

- b) Realize the following four Boolean functions using PAL.

$$F_1(w,x,y,z)=\sum m(0,1,2,3,7,9,11) \quad F_2(w,x,y,z)=\sum m(0,1,2,3,10,12,14)$$

$$F_3(w,x,y,z)=\sum m(0,1,2,3,10,13,15) \quad F_4(w,x,y,z)=\sum m(4,5,6,7,9,15)$$

(8M+8M)

6. a) Construct a JK flip flop using a D flip flop, a 2x1 multiplexer and an inverter.  
 b) Draw the schematic circuit of RS master slave flip flop. Give its truth table and justify the entries in the truth table. (8M+8M)
7. a) Draw the diagram of Mealy type FSM for serial adder.  
 b) Draw the circuit for Moore type FSM. (8M+8M)



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**THERMAL ENGINEERING-I**  
(Mechanical Engineering)

Time: 3 hours

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**PART - A**

1. a) Name four important variables that affect the volumetric efficiency.  
b) What are the three general ranges of throttle operation for an engine and also specify the type of mixture required for each.  
c) Indicate whether the following parameters increase or decrease the knock in SI & CI engines respectively: (i) Speed (ii) Cylinder size (iii) Ignition delay.  
d) Differentiate between absorption type and transmission type dynamometers.  
e) According to ASME, mention the values of pressure ratio for a fan, blower and a compressor.  
f) Define four important dimensionless parameters of axial flow compressor.  
(4M+3M+4M+4M+3M+4M)

**PART - B**

2. a) What is time loss factor? Discuss the effect of time losses in an actual cycle and explain the reasons for reduction in efficiency.  
b) Why the actual cycle efficiency is much lower than the air-standard cycle efficiency. (8+8)
3. a) What is valve timing of 4 stroke engine? Explain its significance through a diagram.  
b) Describe the working of crankcase scavenged two stroke engine with sketches. (8+8)
4. a) With the help of graphs, explain the factors which influence the flame speed in an S.I. engine.  
b) Explain the phenomenon of Knock in C.I. engines. (8+8)
5. During the trial of a single-cylinder, four-stroke oil engine, the following results were obtained. Cylinder diameter = 20cm, Stroke = 40 cm, Mean effective pressure = 6 bar, Torque = 407 Nm, Speed = 250 rpm, Oil consumption = 4 kg/h, Calorific value of fuel = 43 MJ/kg, Cooling water flow rate = 4.5 kg/min, Air used per kg of fuel = 30 kg, Rise in cooling water temperature = 45°C, Temperature of exhaust gases = 420°C, Room temperature = 20°C, Mean specific heat of exhaust gas = 1 kJ/kg K, Specific heat of water = 4.18 kJ/kg K. Find the ip, bp, and draw up a heat balance sheet for the test in kJ/h. (16)
6. The free air delivered by a single stage, double acting air compressor measured at 1.013 bar and 15°C is 14 m<sup>3</sup>/min. The pressure and temperature in the cylinder during induction are 0.95 bar and 32°C. The delivery pressure is 7 bar and the index of compression and expansion, n = 1.3. If the clearance volume is 5% of the swept volume, calculate the indicated power and volumetric efficiency. (16)
7. An axial flow compressor compresses air from an inlet condition of 1 bar and 290K to a delivery pressure of 5 bar with an overall isentropic efficiency of 87 per cent. The degree of reaction is 0.5 and the blade angles at inlet and outlet are 44° and 13° respectively. The mean blade speed and axial velocity are constant throughout the compressor. Assuming a blade velocity of 180 m/s, and workdone factor 0.85, calculate the number of stages. (16)



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 (Mechanical Engineering)

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**PART - A**

1. a) Explain the phenomenon of loss due to rubbing friction in actual cycle
- b) A six cylinder four stroke Diesel engine develops 125 KW at 3000 rpm. Its brake specific fuel consumption is 200 gm/kWh. Calculate the quantity of fuel to be injected per cycle per cylinder. Specific gravity of the fuel is 0.85
- c) Explain the phenomenon of knocking in SI engine
- d) What do mean by heat balance sheet. Explain its significance
- e) List out the advantages of reciprocating compressors
- f) List out the advantages of axial flow compressors over centrifugal compressors  
 (3+4+4+3+4+4)

**PART - B.**

2. a) What is heat loss factor? What is its contribution compared to other losses?  
 b) With the help of a PV diagram for a CFR engine, explain the effect of heat loss on various engine parameters. (8+8)
3. a) What is air-cooling system and in which type of engine it is normally used?  
 b) Describe the evaporative cooling system with a neat sketch. (8+8)
4. a) What is Physical delay? Discuss the factors that affect the delay period in a C.I. engine.  
 b) What is Octane number? Explain how S.I. engine fuels are rated. (8+8)
5. The following results were obtained in a test on a gas engine:  
 Gas used = 0.16 m<sup>3</sup>/min at NTP, Calorific value of gas at NTP = 14 MJ/m<sup>3</sup>, Density of gas at NTP = 0.65 kg/m<sup>3</sup>, Air used = 1.50 kg/min, Specific heat of exhaust gas = 1.0 kJ/kg K, Temperature of exhaust gas = 400<sup>0</sup>C, Room temperature = 20<sup>0</sup>C, Cooling water per minute = 6 kg, Specific heat of water = 4.18 kJ/kg K, Rise in temperature of cooling water = 30<sup>0</sup>C, ip = 12.5 kW, bp = 10.5 kW. Draw a heat balance sheet for the test on per hour basis in kJ. (16)
6. A single acting two stage reciprocating air compressor compresses 4.5 kg of air per minute from 1.013 bar and 15<sup>0</sup> C through a pressure ratio of 9. The intercooling is perfect and the law of compression and expansion.  $pV^{1.3} = \text{constant}$ . Assuming the clearance volumes of both stags 5% of their swept volume and the speed of compressor 300 rpm, calculate the indicated power and the cylinder swept volume. Also calculate the heat loss to the cylinder jacket cooling water and the heat loss to the intercooler circulating water. (16)
7. Following particulars relate to a centrifugal compressor:  
 Inlet diameter of impeller = 61.4 cm, Outlet diameter of impeller – 123 cm, Speed = 5000 rpm, velocity of flow = 61.6 m/s, free air delivered = 1000 m<sup>3</sup>/min, pressure ratio = 1.33, index of compression =16. Assuming that all pressure rise takes place in the impeller, find the angles at which air from impeller enters the casing, breadth of the impeller blade at inlet and outlet. (16)





**II B. Tech II Semester Regular Examinations, May/June - 2015**  
**THERMAL ENGINEERING - I**  
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **THREE** Questions from **Part-B**

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**PART – A**

1. a) Represent the contributions of various losses in an actual cycle of an IC engine with PV diagram.
- b) Draw the P –  $\theta$  diagram for C.I. engine combustion and indicate the stages.
- c) Name the methods that are used for the measurement of friction power of an engine.
- d) Name the sensors that include in an electronic injection system of an I.C. engine.
- e) State six advantages of multistage compression.
- f) Show schematically a centrifugal compressor and indentify the parts.

(5M+3M+2M+4M+4M+4M)

**PART – B**

2. a) What is loss due to rubbing friction? Explain.
- b) What is the main difference between actual cycle and fuel-air cycle of Diesel engine?  
Describe fuel-air cycle and actual cycle combustion for a 2 stroke Diesel engine with the help of PV diagram. (8+8)
3. a) Describe the working of S.U.Carburetor with a neat sketch.
- b) List the factors which affect the process of carburetion. (8+8)
4. a) Distinguish between suction, compression & combustion induced turbulence for a C.I. engine.
- b) Describe the following types of SI engine combustion chambers
  - i) Overhead valve type combustion chamber. ii) F-head type combustion chamber. (8+8)



5. The following observations were made during a trial of a single – cylinder, four-stroke cycle gas engine having cylinder diameter of 18 cm and stroke 24 cm:  
Duration of trial = 30 min, Total number of revolution = 9000, Total number of explosion = 4450, Mean effective pressure = 5 bar, Net load on the brake wheel = 40 kg, Effective diameter of brake wheel = 1m, Total gas used at NTP = 2.4 m<sup>3</sup>, Calorific value of gas at NTP = 19 MJ/m<sup>3</sup>, Total air used = 36 m<sup>3</sup>, Pressure of air = 720 mm Hg, Temperature of air = 17<sup>0</sup>C, Density of air at NTP = 1.29 kg/m<sup>3</sup>, Temperature of exhaust gas = 350<sup>0</sup>C, Room temperature = 17<sup>0</sup>C, Specific heat of exhaust gas = 1 kg/kg K, Cooling water circulated = 80 kg, Rise in temperature of cooling water = 30<sup>0</sup>C. Draw up a heat balance sheet and estimate the mechanical and indicated thermal efficiencies of the engine. Take R = 287 J / kg K. (16)
6. A single cylinder, single acting air compressor has a cylinder diameter of 15.25 cm and a stroke of 22.8 cm. Air is drawn into the cylinder at a pressure of 1.013 bar and a temperature of 15.6<sup>0</sup>C. It is compressed adiabatically to 6.1 bar. Calculate the theoretical power required to drive the compressor if it runs at 100 rpm and the mass of air compressed per minute. (16)
7. A multistage axial compressor is required for compressing air at 293 K through a pressure ratio of 5 to 1. Each stage is to be 50% reaction and the mean blade speed 275 m/s, flow coefficient 0.5, and stage loading factor 0.3, are taken, for simplicity, as constant for all stages. Determine the flow angles and the number of stages required if the stage efficiency is 88.8%. Assume  $c_p = 1.005 \text{ kJ/kg K}$  and  $\gamma = 1.4$  for air. (16)



**II B. Tech II Semester Regular Examinations, May/June – 2015**  
**JAVA PROGRAMMING**  
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

**PART-A**

1. a) What is Object Oriented Programming? How it is different from Procedural concepts?
- b) What is an Object? How to allocate memory for objects?
- c) Can a method be overloaded based on different return type but same argument type ?
- d) What is the purpose of Alive () function in Java.
- e) "Java class can be used both as an applet as well as an application" - Support this statement with an example.
- f) What are the different types of controls available in AWT?
- g) What are assertions?
- h) "Interfaces are able to extend more than one Interface but a Class can't extend more than one Class" - Why? (4M+4M+4M+2M+4M+4M+2M+4M)

**PART - B**

2. a) Explain briefly the following object oriented concepts.  
 i) Abstraction                      ii) Polymorphism  
 b) "Java is called Machine Independent language" - Justify this statement with proper explanation. (8M+8M)
3. a) Write a Java program to sort a given set of strings in the alphabetical order where the strings are supplied through the command line.  
 b) What do you mean by static class and static method? Can we make an instance of an abstract class? Justify your answer with an example? (8M+8M)
4. a) What are the different forms of inheritance? Explain.  
 b) How Packages differ from Interfaces? Explain it with a suitable example program to calculate student marks statement. (8M+8M)
5. a) Write a Java program that prints numbers from 1 to 10 line by line after every 5 seconds  
 b) What is thread synchronization? Discuss with an example. (8M+8M)
6. a) Write a Java program to create a combo box which includes list of subjects. Copy the subjects in text field on click using applet.  
 b) Differentiate between init() and start() methods with examples. (8M+8M)
7. a) Write a Java program to illustrate the use of Flow Layout Manager.  
 b) Write a short note on the following i) JList ii) JScrollPane (8M+8M)



**II B. Tech II Semester Regular Examinations, May/June – 2015**  
**JAVA PROGRAMMING**  
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

**PART-A**

1. a) Write a short note on the features of Object Oriented Programming  
 b) List out the characteristics of the static method.  
 c) What is the difference between an interface and an abstract class?  
 d) What is the importance of synchronization in java?  
 e) What is the role of layout manager in AWT or Swing?  
 f) What are the ways in which we can pass parameters to the applet?  
 g) What are the advantages of event driven programming?  
 h) "Java does not support operator loading" - Support this statement with appropriate reasoning. (4M+4M+4M+2M+4M+2M+4M+4M)

**PART - B**

2. a) Write a Java program to generate a pyramid of numbers for given number N using for loop.  
 b) Discuss on the advantages and disadvantages of Object Oriented Programming. (8M+8M)
3. a) Write a Java program to accepts a file name as command line argument and finds The Length of the longest line in the file and displays an error message if the file Does not exist.  
 b) Explain various access specifies supported by Java with an example (8M+8M)
4. a) Write a java program to illustrate "Constructor Overloading".  
 b) What are the various types of exceptions available in Java? Also discuss on how they are handled? (8M+8M)
5. a) Write a Java program for creating four threads to perform the following operations  
     i) Getting N numbers as input      ii) Printing the even numbers  
     iii) Printing the odd numbers      iv) Computing the average  
 b) Explain how communication between threads takes place with a programming example. (8M+8M)
6. a) Write Applets programs to accomplish the following tasks:  
     i) Drawing polygons ii) Drawing a line graph.  
 b) Can applet class have a constructor? Justify your answer with proper explanation and example. (8M+8M)
7. a) Discuss in detail Menu bars and menus in Java with examples.  
 b) Write a short note on the following  
     i) JFrame      ii) JTabbedPane (8M+8M)



**II B. Tech II Semester Regular Examinations, May/June – 2015**  
**JAVA PROGRAMMING**  
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**
- 

**PART-A**

1. a) "Write Once and Run Anywhere" - Support this statement with proper reasoning.  
 b) What is a constructor? When does the compiler supply default constructor for a class?  
 c) Differentiate between array and vector with examples.  
 d) What is a daemon thread?  
 e) What is an event? What methods are available to handle events in java?  
 f) List out the differences between AWT and Swings.  
 g) Give an example to illustrate the use of parseInt() method?  
 h) What is the difference between the >> and >>> operators?  
 (4M+4M+2M+4M+4M+4M+2M)

**PART – B**

2. a) Write a Java program to interchange the rows and columns of a given matrix.  
 b) Write short note on the following Object Oriented concepts  
 i) Encapsulation ii) dynamic binding (8M+8M)
3. a) Discuss various control structures available in Java.  
 b) Write a program to perform the following functions using classes, objects, constructors and destructors wherever necessary  
 i) Read 5 subjects marks of 5 students  
 ii) Calculate the total and print the result on the screen (8M+8M)
4. a) Explain Creating Packages and Accessing a Package with examples.  
 b) Write a Java program to find the area and perimeter of square and circle using interface. (8M+8M)
5. a) Explain the following with necessary code snippets  
 i) Creating thread ii) Stopping and Blocking a Thread  
 b) "Threads can be given priorities" - Support this statement with suitable example. (8M+8M)
6. a) Describe the different stages in the life cycle of an Applet.  
 b) Explain in brief the event-handling mechanism in java with an example. (8M+8M)
7. a) Explain about any two Layout Managers with example programs.  
 b) Explain the features of Swings in java. (8M+8M)



**II B. Tech II Semester Regular Examinations, May/June – 2015**  
**JAVA PROGRAMMING**  
(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **THREE** Questions from **Part-B**

**PART-A**

1. a) Write a Java program to find the value of n!, where n is a given integer.  
b) Illustrate type casting in java with an example.  
c) Differentiate between sleep () and wait ().  
d) Discuss various methods used to create threads?  
e) What is source and listener in java event handling?  
f) List the features of swings.  
g) "Abstract classes can be defined without any abstract methods" - support this statement with proper reasoning.  
h) What is the difference between & operator and && operator?  
(4M+2M+4M+4M+4M+4M+2M)

**PART - B**

2. a) Write a Java program to check whether a given number is palindrome or not?  
b) Explain about Java Tokens with examples. (8M+8M)
3. a) Write a java program to simulate the operation of numerical calculator to perform the functions Addition (+), Subtraction (-), Multiplication (\*) and Division (/).  
b) Explain clearly about how Java handles cleaning up of unused objects. (8M+8M)
4. a) Explain about Exception Handling in Java with examples.  
b) Why do constructors does not have any return type? Explain it with proper example. (8M+8M)
5. a) Write a Java program to demonstrate multithreading operation.  
b) Explain various thread states and properties in detail. (8M+8M)
6. a) Write an applet program that has different shapes in it.  
b) Explain action event with suitable example. (8M+8M)
7. a) Explain any two AWT controls in java with suitable examples.  
b) Design a screen in Java which accepts text in text box. If the left mouse is clicked, convert the text to uppercase and if the right button is clicked, convert it to lower case. (8M+8M)



**II B. Tech II Semester Supplementary Examinations May/June - 2015**

**STRENGTH OF MATERIALS**

(Civil Engineering)

Time: 3 hours

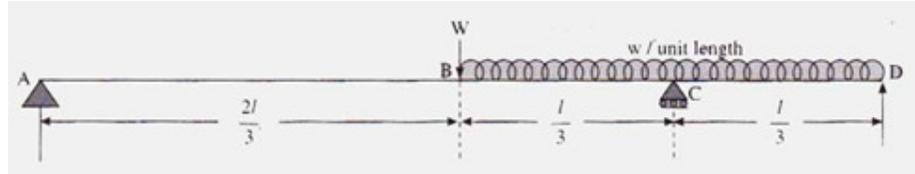
Max. Marks: 75

Answer any **FIVE** Questions

All Questions carry **Equal** Marks

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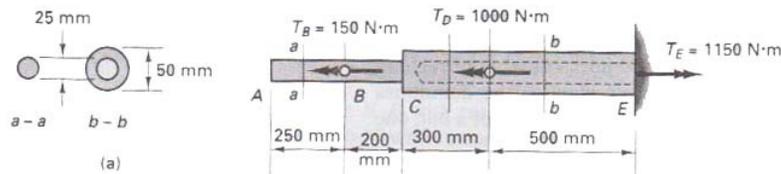
1. For the beam shown in Figure. Find the deflection at D and the maximum deflection between A and B.



2. A cylindrical shell 900 mm long, 150 mm internal diameter, having a thickness of metal 8mm, is filled with a fluid at atmospheric pressure. If an additional 20,000 mm³ of fluid is pumped into the cylinder find. (i) the pressure exerted by the fluid on the cylinder, and (ii) the hoop stress induced.

Take. $E = 2 \times 10^5 \text{ N/mm}^2$ and $\frac{1}{m} = 0.3$

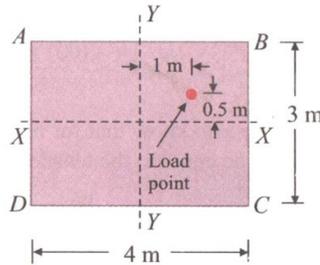
3. A beam 3 metres long, of I section is freely supported at its ends with the web vertical. It carries concentrated loads of 100 kN at 0.6 metre from each end. The flanges are each 150 mm wide and 25 mm thick, the overall depth being 400 mm. The thickness of the web is 12.5 mm. Calculate the principal stresses and the maximum shearing stress in a section of the beam where the bending moment and shearing forces, both have maximum values.
4. The stepped shaft is as shown in Figure is rigidly attached to a wall at E. Determine the angle of twist of the end A when the two torques at B and at D are applied. Assume the shear modulus G to be 80 GPa for steels.



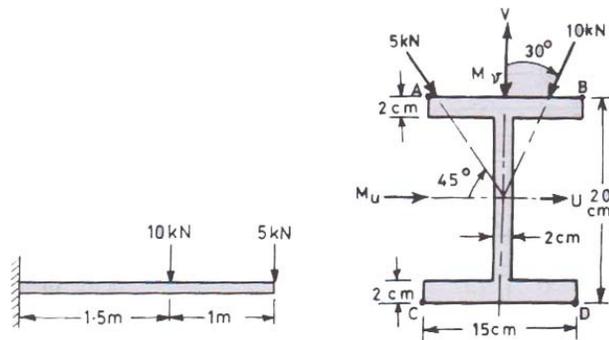
5. a) What are the limitations of Euler's formula.
 b) A cast iron column with a 10 cm external diameter and 8 cm internal diameter is 3 m long. Calculate the safe load using Rankine's formula if (i) both ends are hinged, (ii) both ends are fixed. $\sigma_c = 600 \text{ N/mm}^2$ and $a = 1/1600$. Adopt a factor of safety of 3.



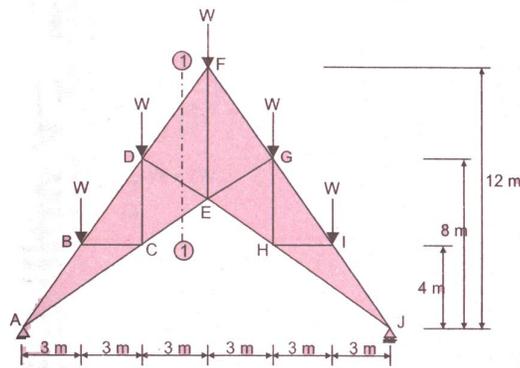
6. A masonry pier of 3 m x 4 m supports a vertical load of 80kN as shown in figure.
- Find the stresses developed at each corner of the pier.
 - What additional load should be placed at the centre of the pier, so that there is no tension anywhere in the pier section?
 - What are the stresses at the corners with the additional load in the centre?



7. A cantilever beam of I-section is used to support the loads inclined to the V-axis as shown in figure. Calculate the stresses at the corners A,B,C and D. Also locate the neutral axis.



8. Determine the forces in the members AB, AC, DF and CE of the scissors truss shown in figure.



II B. Tech II Semester Supplementary Examinations May/June - 2015

STRENGTH OF MATERIALS

(Civil Engineering)

Time: 3 hours

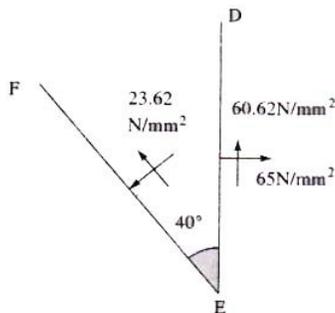
Max. Marks: 75

Answer any **FIVE** Questions

All Questions carry **Equal** Marks

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1. A beam simply supported at the ends has a span  $l$  carries three point's load  $W$  each symmetrically placed on the span at interval of  $\frac{l}{4}$ . Find the central deflection and slope at the ends.
2. A cylinder 250 mm in diameter has a wall thickness of 5 mm and is full of a fluid at atmospheric pressure. Its ends are closed by rigid plates and an axial compressive force of 80kN is applied to the cylinder so that the pressure of the fluid rises by 90 kPa. Calculate the bulk modulus of the fluid. Take for the cylinder material  $E = 200\text{kN/mm}^2$  and  $\frac{1}{m} = 0.25$ .
3. Figure shows the normal and tangential stresses on two planes. Determine the principal stresses.



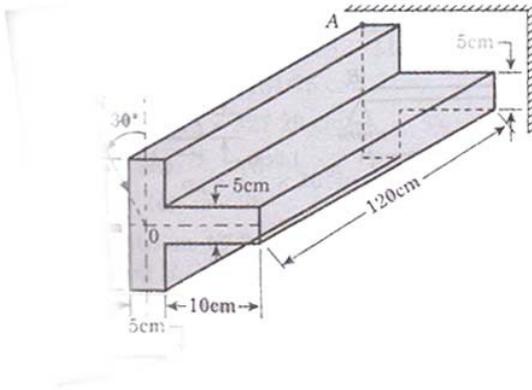
4. A solid shaft is required to transmit 330 kW at 120 r.p.m. The shear stress of the material must not exceed  $80 \text{ MN/m}^2$ . (a) Find the diameter required. (b) If the shaft is replaced by a hollow one with a diameter ratio of 3:5 and the maximum shear stress remaining unchanged, calculate the percentage saving in weight that could be obtained.
5. Derive the Rankine Gordon empirical formula established for the design of columns.
6. a) What conditions are implemented to ensure the stability of the dam.  
b) A concrete dam of rectangular section 15 m high and 6 m wide contains water up to a height of 13 m. Find  
total pressure per metre length of the dam,  
Point, where the resultant cuts the base and



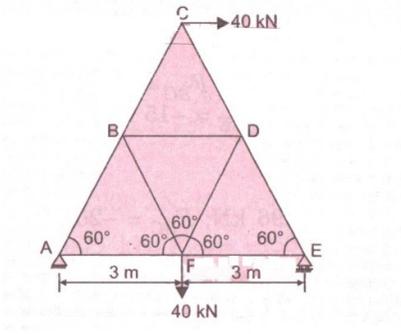
Maximum and minimum intensities of stress at the base.

Assume weight of water and concrete as  $10$  and  $25 \text{ kN/m}^3$  respectively.

7. For the beam loaded as shown in Figure. Determine the stress at A and locate the neutral axis. A Force of  $30 \text{ kN}$  at  $30^\circ$  is applied at O. The Flange thickness is  $5 \text{ mm}$  and height of the flange(vertically) is  $15 \text{ cm}$ .



8. Find the forces in all the members of a truss as shown in figure.



**II B. Tech II Semester Supplementary Examinations May/June - 2015****STRENGTH OF MATERIALS**

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

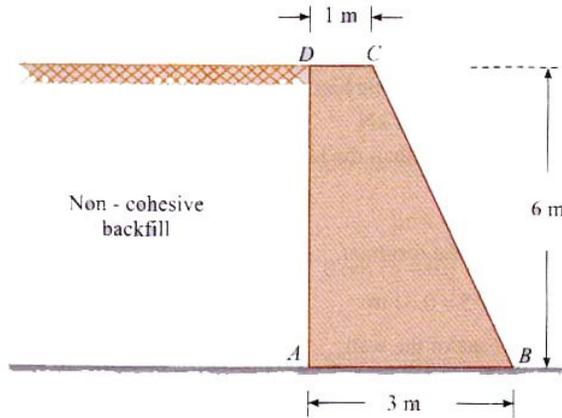
Answer any **FIVE** QuestionsAll Questions carry **Equal** Marks

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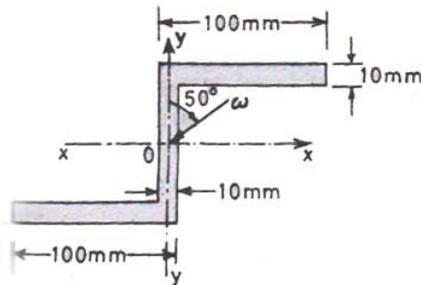
1. Describe the procedure to find out the deflection of a beam using Macaulay's method with various conditions about the slope and deflection.
2. The internal and external radii of a thick cylinder are 200 mm and 300 mm respectively. The external pressure on the cylinder is 4 N/mm^2 . Find the internal pressure that can be applied if the maximum hoop stress is limited to 15 N/mm^2 . Sketch also the distribution of radial pressure and hoop stress across the wall section.
3. A bending moment M applied to a solid round shaft causes a maximum direct stress at elastic failure. Determine the numerical relation between M and a twisting moment T which acting alone on the shaft will produce elastic failure, according to each of the following theories of failure.
Maximum principal stress theory,
Maximum principal strain theory,
Maximum strain energy theory,
Maximum shear stress theory,
Take Poisson's ratio = 0.30.
4. Prove that a hollow shaft is stronger and stiffer than a solid shaft of same material, length and weight.
5. A steel strut, 3 m long and hinged at both ends, has a circular cross-section. Find the necessary diameter in order that a thrust of 200 kN acting at an eccentricity of $1/10^{\text{th}}$ diameter will not produce a compressive stress greater than 100 N/mm^2 . If the yield stress is 330 N/mm^2 , find the crippling load of the strut for the same eccentricity. $E = 205 \text{ kN/mm}^2$.



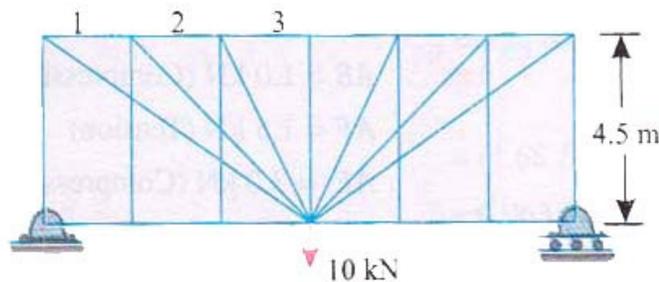
6. Find the stability of the retaining wall shown in Figure. Also find the extreme stresses at the base of the wall as 16 kN/m^3 respectively. Assume angle of internal friction of the soil as 30° .



7. The cross-section of a beam is shown in Figure. It carries a load of 10 kN/m over its whole simply supported span of 1 m . Determine central deflection. Take $E = 70 \text{ GN/m}^2$. The plane of loading is 50° to the plane of the web.



8. A truss 15 m long is subjected to a point load of 10 kN as shown in Figure. Find the forces in the members 1, 2 and 3 of the truss.



II B. Tech II Semester Supplementary Examinations May/June - 2015**STRENGTH OF MATERIALS**

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

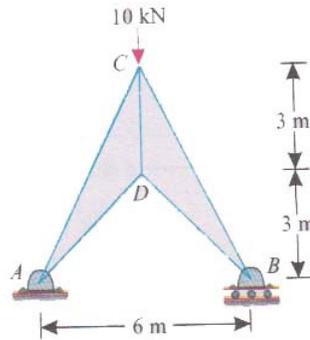
Answer any **FIVE** QuestionsAll Questions carry **Equal** Marks

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1. A horizontal beam of symmetrical section simply supported at the ends, carries a load whose intensity varies uniformly from 18kN/m at one end to 72 kN/m at the other. Find the central deflection in the span is 6 m, the section is 450 mm deep and the maximum bending stress is 90 N/mm<sup>2</sup>. Take E = 200 kN/mm<sup>2</sup>.
2. A thick spherical shell of 160 mm internal diameter is subjected to an internal fluid pressure 40 N/mm<sup>2</sup>. If the permissible tensile stress is 80N/mm<sup>2</sup>, find the thickness of the shell.
3. A hollow shaft is subjected to a torque of 36000 Nm and a bending moment of 27000 Nm. The internal diameter of the shaft is one half of the external diameter. If the maximum shear stress shall not exceed 80 N/mm<sup>2</sup>, find the diameter of the shaft.
4. a) Derive the deflection of open coiled, helical spring under axial pull.  
b) A close coiled helical compression spring of 12 acting coils has a spring stiffness of K. It is cut into two springs having 5 & 7 turns. Determine spring stiffness of resulting spring.
5. a) Derive the maximum stress for a laterally loaded struts subjected to uniformly distributed load.  
b) Compare the effective length as a long column with different end conditions.
6. a) Classify and explain the earth pressure of the soil.  
b) A chimney shaft 30 m high, tapers from 3 m external diameter at the base to 1.5 m external diameter at the top. The inside diameter at the base 2 m. if the horizontal wind pressure acting on a flat surface is 1500 N/m<sup>2</sup>, find the distribution of stress on the base. Weight of chimney is 2 MN. Reduction factor for wind resistance for a circular section is 0.6.
7. A wooden beam of cross-section 80 mm x 240 mm rests on an earth foundation. The modulus of elasticity of wood is 10 GN/m<sup>2</sup> and modulus of foundation is 5 MN/m<sup>2</sup>. A uniformly distributed load of 2 kN/m acts on the middle portion of this very long beam over a span of 2m. Compute the maximum deflection and the maximum bending stress in the beam.



8. A framed structure of 6 m span is carrying a central point load of 10 kN as shown in Figure.



**II B. Tech II Semester Supplementary Examinations May/June - 2015****ELECTRICAL MACHINES - II**

(Electronics and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

- ~~~~~
1. a) Explain the types of Single phase transformers.  
b) Explain the working principle of operation of single phase transformer under leading load condition with phasor diagram. (8M+7M)
  
  2. a) Derive the condition for maximum efficiency of a single phase transformer.  
b) At 400 V and 50 Hz the core loss of a transformer was found to be 2400 W. When the transformer is supplied at 200 V and 25 Hz, the core loss is 800 W. Calculate the hysteresis and eddy current loss at 400 V and 50 Hz. (7M+8M)
  
  3. a) Explain the principle and operation of an Auto transformer in detail.  
b) The readings obtained from the open circuit and short circuit tests on a single phase transformer of 100 kVA, 1100 V/220 V rating are given  
O. C. test: supply is given to the low voltage side.  $V_2=220$  V,  $I_{02}=20$  A,  $W_0=500$  W  
S. C. test: short circuit test is conducted on HV side  $V_{SC}=90$  V,  $I_1=90.9$  A,  $W_{SC}=1000$  W  
Calculate the various parameters and draw the equivalent circuit of the transformer. (8M+7M)
  
  4. a) What is meant by 3 – phase transformer groups? What is the significance of these groups?  
What are the possible connections for a 3 – phase transformer bank? Explain.  
b) A 3 – phase, 1000 kVA, 6600 V/1100 V transformer is delta connected on the primary and star connected on the secondary. The primary resistance per phase is 1.8 ohm and secondary resistance per phase is 0.025 ohm. Determine the efficiency on full load at (i) unity power factor (ii) 0.8 power factor lagging if the iron loss is 15 kW. (10M+5M)



5. a) Explain how the rotating magnetic field is produced in a 3 – phase induction motor and also explain its principle of operation.
- b) A 12 – pole, 3 – phase alternator is coupled to an engine running at 500 rpm. It supplies an induction motor which has a full load speed of 1440 rpm. Find the slip and the number of poles of the motor. (10M+5M)
6. a) What is crawling and cogging? Explain in detail.
- b) A 6 – pole, 50 Hz, 3 – phase induction motor running on full load develops a useful torque of 150 Nm at a rotor frequency of 1.5 Hz. Calculate the shaft power output if the mechanical torque lost its friction be 10 Nm, determine: (i) rotor copper loss (ii) The input to the motor (iii) the efficiency. (8M+7M)
7. a) Explain any one method of starting of a 3 – phase induction motor.
- b) Draw the circle diagram for a 3 – phase, 6 – pole, 50 Hz, 400 V, star connected Induction motor from the following data (line value).
- No load test: 400 V, 10 A, 1400 W
- Blocked rotor test: 200 V, 55 A, 7000 W.
- The stator loss at stand still is 60 % of the total copper losses and full load current is 30A. from the circle diagram determine: (i) Power factor, Slip, output, efficiency, Speed. (ii) Starting torque (iii) Maximum power output and inputs. (iv) Maximum torque and slip. (5M+10M)
8. a) Explain the speed control of 3 – phase induction motors.
- b) Explain the principle and operation of induction generator. (8M+7M)



**II B. Tech II Semester Supplementary Examinations May/June - 2015****ELECTRICAL MACHINES - II**

(Electronics and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks  
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1. a) Derive the emf equation of single phase transformer.
b) A 3300/250 V, 50 Hz single phase transformer is built on a core having an effective cross-sectional area of 125 cm^2 and 70 turns on the low-voltage winding. Calculate: (i) The value of maximum flux density (ii) The number of turns on the high voltage winding. (7M+8M)

2. a) Derive the expression for value of current at maximum efficiency.
b) In a transformer, the core loss is 100 W at 40 Hz and 72 W at 30 Hz. Find the hysteresis and eddy current losses at 50 Hz. (7M+8M)

3. a) Explain the parallel operation of single phase transformer in detail.
b) A 250 kVA transformer with 0.015 per unit resistance and 0.04 per unit reactance is connected in parallel with a 500 kVA transformer having 0.01 per unit resistance and 0.05 per unit reactance to share a load of 750 kVA at 0.80 power factor lagging. Find how the transformers share the load when the open circuit secondary voltages are 400 V on no load. (8M+7M)

4. a) Explain the advantages of using tertiary winding.
b) A 3 – phase, step down transformer takes 15 A when connected to 4400 V mains. The turn ratio per phase is 10. Neglecting losses find the secondary line voltage, line current and output if the transformers windings are connected in delta/star. (8M+7M)



5. a) Explain the constructional details of 3 – phase induction motors.
b) A 3 – phase, 50 Hz, 4 – pole induction motor has a slip of 4%. Calculate (i) Speed of the motor (ii) frequency of the rotor emf. (10M+5M)
6. a) Write short notes on double cage and deep bar rotors.
b) The power input to the rotor of 440 V, 50 Hz, 6 – pole, 3 – phase induction motor is 80 kW. The rotor emf is observed to make 100 complete alternations per minute. Calculate: (i) the slip (ii) the rotor speed (iii) mechanical power developed (iv) the rotor copper loss per phase (v) the rotor resistance per phase if the rotor current is 65 A (8M+7M)
7. a) What is circle diagram ? What is its significance? How it can be drawn.
b) A 50 kW, 6 – pole, 50 Hz, 450 V, 3 – phase slip ring induction motor furnished the following test figures.
No load test: 450 V, 20 A, p. f = 0.15
Blocked rotor test: 200 V, 150 A, p. f=0.3
The ratio of stator to rotor copper losses on short circuit was 5:4. Draw the circle diagram and determine from it (i) the full load current and power factor (ii) the maximum torque and the maximum power input (iii) slip at full load (iv) efficiency at full load. (8M+7M)
8. a) Explain any two speed control methods of 3 – phase induction motors in detail.
b) Write short notes on Induction generator. (10M+5M)



II B. Tech II Semester Supplementary Examinations May/June - 2015**ELECTRICAL MACHINES - II**

(Electronics and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Explain the constructional details of single phase transformers.  
b) A transformer with an output voltage of 4200 V is supplied at 230 V. If the secondary has 2000 turns, calculate the number of primary turns. Derive the formulae used. (8M+7M)
  
2. a) Draw and derive the equivalent circuit parameters of a single phase transformer.  
b) A single phase transformer working at unity power factor has an efficiency of 90 % at both half load and at the full load of 500 W. Determine the efficiency at 75 % full load. (8M+7M)
  
3. a) Explain the significance and procedure to conduct Sumpner's test on a single phase transformer with neat circuit diagram.  
b) A 50 kVA, 2200 V/1100 V single phase 50 Hz transformer has a full-load efficiency of 95% and iron loss of 500 W. The transformer is connected as an Auto-transformer to a 3300 V supply. When it delivers a load of 50 kW at unity power factor at 1100 V, calculate the currents in the windings. Find also the increase in output as auto-transformer; also calculate the copper losses as two winding transformer. (8M+7M)
  
4. a) Explain with the help of connection and phasor diagram, how the Scott connections are used to obtain two-phase supply from 3 – phase supply mains.  
b) A 3 – phase, step down transformer takes 15 A when connected to 4400 V mains. The turn ratio per phase is 10. Neglecting losses find the secondary line voltage, line current and output if the transformers windings are connected in star/delta. (10M+5M)



5. a) Explain the principle and operation of a 3 – phase induction motor by explaining rotating magnetic field.  
b) A 3 – phase, 6 – pole, 50 Hz induction motor has a slip of 1% at no load, and 3% at full load. Determine (i) Synchronous speed (ii) No load speed (iii) Full load speed (10M+5M)
6. a) Draw and explain slip – torque characteristics of 3 – phase induction motor.  
b) The stator loss of a 3 – phase induction motor is 2 kW. When the power input is 90 kW, what will be the rotor mechanical power developed and the rotor copper loss if the motor is running with a slip of 4%. (7M+8M)
7. a) Explain direct on line starting method of induction motor.  
b) What is the purpose of conducting no load and blocked rotor tests on a 3 – phase induction motors. Explain the procedure with neat circuit diagram and also explain the relevant calculations. (7M+8M)
8. a) Explain the principle of operation of induction generator in detail and what are its limitations.  
b) Explain any one speed control methods of 3 – phase induction motor. (8M+7M)



**II B. Tech II Semester Supplementary Examinations May/June - 2015****ELECTRICAL MACHINES - II**

(Electronics and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Explain the working principle of operation of single phase transformer under lagging load condition with phasor diagram.
b) A transformer with an output voltage of 4000 V is supplied at 220 V. If the secondary has 1000 turns, calculate the number of primary turns. (7M+8M)
2. a) How will you minimize the hysteresis and eddy current losses that occur in single phase transformers?
b) A 10 kVA, Single phase transformer for 2000/400 V at no load, has $R_1=5.5\Omega$, $X_1=12\Omega$, $R_2=0.2\Omega$, $X_2=0.45\Omega$. Determine the approximate value of the secondary voltage at full load, 0.8 p.f lagging, when the primary applied voltage is 2000 V. (7M+8M)
3. a) Explain how will you pre determine the efficiency and regulation by conducting OC and SC tests on a single phase transformer with neat circuit diagrams.
b) An open circuit test on a 50 kVA, 2400 V/240 V transformer gives 240 V, 5.41 A and 186 W when the measurement were made on secondary side. The short circuit test results when measured on the primary side are 48 V, 20.8 A and 617 W. Calculate the efficiency and regulation at full load with a power factor of 0.8 lagging. (8M+7M)
4. a) Explain the working principle and constructional details of three phase transformer and also explain the possible connections for a 3 – phase transformer bank.
b) A 3 – phase transformer has a delta connected primary and is supplied at 11000 V. The terminal voltage (line voltage) of the star connected secondary at 0.8 power factor lagging is 400 V. The effective resistance and reactance drops are 1.5 % and 6% respectively. Determine the approximate transformation ratio. (10M+5M)



5. a) Determine the rotor emf, frequency, current and reactance under running condition of a 3 – phase induction motor.
b) The frequency of the emf in the stator of a 4 – pole induction motor is 50 Hz, and that in the rotor is 1.5 Hz. What is the slip, and at what speed is the motor running. (10M+5M)
6. a) Derive the expression for torque of a 3 – phase induction motor. From the torque equation deduce the expressions for maximum torque and starting torque for 3 – phase induction motor.
b) The power input to a 3 – phase induction motor is 60 kW. The stator losses total is 1 kW. Find the total mechanical power developed and the rotor copper loss per phase if the motor is running with a slip of 3%. (8M+7M)
7. a) Explain the significance and the procedure of no load test on a 3 – phase induction motor.
b) Explain any one starting methods of 3 – phase induction motors. (10M+5M)
8. a) Explain the principle of operation of Induction generator. List some applications of induction generator
b) Explain the starter voltage control of Induction motor. (7M+8M)



II B. Tech II Semester Supplementary Examinations May/June - 2015**ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Describe the operation of switching modulator.  
b) Consider a single-tone conventional AM signal with a total power of 1 kW. What is the power in each of the sideband frequency components if the modulation depth is 70%.
2. a) Explain the operation of ring modulator.  
b) What is the effect of carrier frequency incoherence in the process of demodulation of DSB-SC wave?
3. a) Obtain the Hilbert transform of  $m(t) = \text{sinc}(t)$ .  
b) What condition must be the VSB filter transfer function satisfy for distortion-free transmission?
4. a) Give the main advantage as well as main tradeoff in FM.  
b) Compare and contrast single-tone FM and PM.
5. Give a qualitative explanation of the noise performance of the SSB-SC system.
6. Explain the operation of phase modulated FM transmitter.
7. Explain the following terms:  
i) Sensitivity ii) Selectivity iii) Image frequency iv) Amplitude limiting
8. Explain the following terms:  
i) PAM ii) TDM



**II B. Tech II Semester Supplementary Examinations May/June - 2015****ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) A signal $m(t) = 10 \cos(2\pi 10^3 t)$ amplitude modulates a carrier. If the bandwidth of the transmitted signal has to be less than 2% of the carrier frequency, what should the carrier frequency be?
b) Describe the operation of envelope detector.
2. a) Why was DSB-SC modulation scheme not adopted for commercial voice/music signal broadcasting? Explain.
b) Explain the operation of balanced modulator.
3. a) Is it possible to generate an SSB signal that can be detected by a linear envelope detector? Explain.
b) Explain the phase-shift method of SSB-SC generation.
4. a) Explain the direct method of FM generation.
b) Explain how an envelope detector can be used to demodulate an FM signal.
5. Explain why the noise performance of an AM system using synchronous detection is superior to that of an AM system using envelope detection.
6. Explain the operation of variable-reactance type FM transmitter.
7. Explain the operation of superheterodyne receiver.
8. a) Explain the process of generation of PAM signals.
b) Distinguish between FDM and TDM.



II B. Tech II Semester Supplementary Examinations May/June - 2015**ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Determine the power efficiency of the amplitude modulated wave:  
 $s(t) = [2 + \cos(50\pi t)] \cos(20000\pi t)$   
b) Sketch the magnitude spectrum of a conventional AM signal with carrier frequency 1MHz and the message signal frequency 1 kHz.  
c) What is the need for modulation? Explain.
2. a) Explain the working of a product modulator.  
b) What is quadrature-null effect? Explain.
3. Derive an expression for canonical representation of USSB signal.
4. a) Show that FM is more immune to nonlinear distortion than AM.  
b) Why does FM, in general, require much larger bandwidth than AM?
5. Derive the expression for the output SNR for an ideal baseband communication system. State the assumptions involved.
6. a) Explain the operation of AM transmitter.  
b) Write notes on frequency stability in FM transmitters.
7. a) Why are many RF amplifiers used in TRF receiver? Explain.  
b) Explain the principle of operation of super heterodyne FM receiver.
8. a) Explain the operation of PWM generator.  
b) Describe the demodulation of PPM waves.



**II B. Tech II Semester Supplementary Examinations May/June - 2015****ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Derive an expression for effective modulation index for multi-tone modulation.
b) Describe the operation of square-law modulator.
2. a) Describe the operation of Costas loop receiver.
b) Give the working principle of a squaring synchronizer.
3. a) Describe the filter method of SSB signal generation.
b) Distinguish between different amplitude modulation schemes.
4. a) Give the details of the frequency and bandwidth of the signals used in commercial FM radio broadcasting. What is Carson's rule?
b) Show how a PM signal can be demodulated using an FM demodulator.
5. Explain pre-emphasis and de-emphasis circuits.
6. a) Give the classification of radio transmitters.
b) What is the effect of feedback on performance of AM transmitter? Explain.
7. In the context of radio receivers, define the terms:
 - a) selectivity
 - b) sensitivity
 - c) image frequency rejection ratio
 - d) Q-factor
8. Write notes on the following terms:
 - a) Dual polarity PAM
 - b) Demodulation of PWM signals



II B. Tech II Semester Supplementary Examinations May/June - 2015**OBJECT ORIENTED PROGRAMMING THROUGH JAVA**

(Com. to CSE, IT, ECC)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

- ~~~~~
1. a) Explain clearly how the following terms are related to Java.
i. Architecture-Neutral ii. Robust iii. High-performance iv. Dynamic
b) What is an object in OOP? Write a short note on Constant Objects with suitable example. (8M+7M)
 2. a) Does OOPs support multiple constructors' concept? Support or Oppose this statement with Suitable explanation
b) Write a simple Java program to illustrate type conversion. (8M+7M)
 3. a) What is polymorphism? Differentiate between method overloading and method overriding with an example.
b) With an example explain the effect of using final keyword in inheritance. (8M+7M)
 4. a) "Interface variables are static and final by default in Java" - Support this statement with proper explanation.
b) What is the difference between an Interface and an Abstract Class? (8M+7M)
 5. a) What is an Exception? What are the three categories of exceptions?
Also discuss the advantages of exception handling.
b) Explain thread life cycle in detail. (8M+7M)
 6. a) Write an applet program that accepts two input string using <param> tag and Concatenate the strings and display it in status window.
b) "Applets can be used to play audio files" - Support this statement with suitable example. (8M+7M)
 7. a) Explain clearly the following components of AWT with suitable examples each
i. Canvas ii. Scrollbar
b) Write an applet program for illustrating keyboard events in java. (8M+7M)
 8. a) Discuss the following SWING containers used while designing GUI using swing.
i. JMenuBar ii. JScrollbar
b) Write a short note on the following Java Swing Events
i. eventsource ii. Eventobject (8M+7M)



II B. Tech II Semester Supplementary Examinations May/June - 2015**OBJECT ORIENTED PROGRAMMING THROUGH JAVA**

(Com. to CSE, IT, ECC)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Explain the following Object Oriented concepts with suitable examples.  
i) Data Encapsulation ii) Method Overriding  
b) Discuss the merits and demerits of OOP technology (8M+7M)
2. a) What is the purpose of variable in any programming language? Discuss clearly the scope and life time of variables with respect to Java programming language.  
b) Discuss clearly on various control statements (along with their syntax) available with Java. (8M+7M)
3. a) What is inheritance? Discuss Extension and Specification with suitable programming Examples.  
b. Explain in detail the concept of Late binding with an example. (8M+7M)
4. a) Explain the difference between Classes and Interfaces with example?  
b) Illustrate with an example the concept of extending interfaces. (8M+7M)
5. a) Explain clearly how synchronization is achieved in Java threads.  
b) Illustrate the creation of user defined exception with an example program. (8M+7M)
6. a) Distinguish between Applets and Applications.  
b) Design an applet to display three buttons "Blue", "Black" and "White". The color of the background changes according to the button pressed by the user. Also, write the HTML code to display the applet. (6M+10M)
7. a) Explain clearly the following components of AWT with suitable examples each  
i) Button ii. Text Area  
b) Write a program to create a window and set its title with "JNTUK" using AWT (8M+7M)
8. a) Discuss the following SWING containers used while designing GUI using swing.  
i) JDialog ii. JApplet  
b) "Java supports the creation of simple tables using Swings" - Support this statement with suitable example. (8M+7M)



**II B. Tech II Semester Supplementary Examinations May/June - 2015****OBJECT ORIENTED PROGRAMMING THROUGH JAVA**

(Com. to CSE, IT, ECC)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Explain the following Object Oriented concepts with suitable examples
i) Class ii. Data Abstraction
b) Compare and contrast Procedural Programming with Object Oriented Programming. (8M+7M)
2. a) What is recursion? Write a recursive program in Java to find the GCD of given two numbers.
b) Write a short note on the following
i) This keyword ii. Garbage Collection (8M+7M)
3. a) What is the need of abstract method and a class in Java? Explain.
b) Illustrate the purpose of Super Keyword in Java with an example.
c) Discuss the benefits of inheritance. (5M+5M+5M)
4. a) Differentiate between PATH and CLASSPATH in Java.
b) Discuss various steps involved in creating a package. (6M+10M)
5. Clearly distinguish between Multithreading and Multitasking with one programming example each. (15M)
6. a) Explain the constituents of an applet tag by giving its syntax.
b) Explain the code for an applet program that receives the value of the parameter message from the HTML file and display it. (5M+10M)
7. a) Explain event handling along with different event types in java.
b) Explain clearly the following components of AWT with suitable examples each
i) Checkbox ii) Label (8M+7M)
8. a) Discuss the following SWING containers used while designing GUI using swing.
i) JFrame ii) JWindow
b) Discuss in detail the limitations of AWT. (8M+7M)



II B. Tech II Semester Supplementary Examinations May/June - 2015**OBJECT ORIENTED PROGRAMMING THROUGH JAVA**

(Com. to CSE, IT, ECC)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. Explain clearly how the following terms are related to Java.  
i) Portable ii) Distributed iii) Secure iv) Interpreted  
b) Discuss any four features of OOPs.  
c) Differentiate between Structure and a Class in terms of access modifier. (8M+4M+3M)
2. a) Explain copy constructors with an example.  
b) What is the objective of passing parameters in Java? Explain various ways of passing parameters with suitable examples in Java. (8M+7M)
3. a) Discuss the following forms of inheritance with an example each  
i) Construction ii) Specialization  
b) Java supports various ways to control access to members of a class. Explain (8M+7M)
4. a) What is user defined packages? Explain various steps involved in creating a package with an example.  
b) "Class implements interface but an interface extends another interface" - Support this statement with proper example. (8M+7M)
5. Explain the usage of following terms with respect to exception handling. (Also write a java program to illustrate the same)  
i) Try ii) catch iii) throw iv) finally (15M)
6. a) What are the pros and cons of Java applets. Develop an applet that receives N numerical values as input from the user and then displays the average of these numbers on the screen. Write the HTML code that calls the applet.  
b) Explain various methods involved in the life cycle of an applet. (8M+7M)
7. a) Explain clearly the following components of AWT with suitable examples each  
i) Scrollbar ii) TextField  
b) What are Layout Managers? Differentiate between Border and Grid Layout with a programming example each. (8M+7M)
8. a) Write a detailed note on MVC architecture. Discuss its advantages and disadvantages.  
b) What is the role of tabbedpanes in Java? Explain it with an example. (7M+8M)



**II B. Tech II Semester Supplementary Examinations, May/June - 2015****ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Describe the operation of switching modulator.
b) Consider a single-tone conventional AM signal with a total power of 1 kW. What is the power in each of the sideband frequency components if the modulation depth is 70%.
2. a) Explain the operation of ring modulator.
b) What is the effect of carrier frequency incoherence in the process of demodulation of DSB-SC wave?
3. a) Obtain the Hilbert transform of $m(t) = \text{sinc}(t)$.
b) What condition must be the VSB filter transfer function satisfy for distortion-free transmission?
4. a) Give the main advantage as well as main tradeoff in FM.
b) Compare and contrast single-tone FM and PM.
5. Give a qualitative explanation of the noise performance of the SSB-SC system.
6. Explain the operation of phase modulated FM transmitter.
7. Explain the following terms:
i) Sensitivity ii) Selectivity iii) Image frequency iv) Amplitude limiting
8. Explain the following terms:
i) PAM ii) TDM



II B. Tech II Semester Supplementary Examinations, May/June - 2015**ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) A signal  $m(t) = 10 \cos(2\pi 10^3 t)$  amplitude modulates a carrier. If the bandwidth of the transmitted signal has to be less than 2% of the carrier frequency, what should the carrier frequency be?  
b) Describe the operation of envelope detector.
2. a) Why was DSB-SC modulation scheme not adopted for commercial voice/music signal broadcasting? Explain.  
b) Explain the operation of balanced modulator.
3. a) Is it possible to generate an SSB signal that can be detected by a linear envelope detector? Explain.  
b) Explain the phase-shift method of SSB-SC generation.
4. a) Explain the direct method of FM generation.  
b) Explain how an envelope detector can be used to demodulate an FM signal.
5. Explain why the noise performance of an AM system using synchronous detection is superior to that of an AM system using envelope detection.
6. Explain the operation of variable-reactance type FM transmitter.
7. Explain the operation of superheterodyne receiver.
8. a) Explain the process of generation of PAM signals.  
b) Distinguish between FDM and TDM.



**II B. Tech II Semester Supplementary Examinations, May/June - 2015****ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Determine the power efficiency of the amplitude modulated wave:
 $s(t) = [2 + \cos(50\pi t)] \cos(20000\pi t)$
b) Sketch the magnitude spectrum of a conventional AM signal with carrier frequency 1MHz and the message signal frequency 1 kHz.
c) What is the need for modulation? Explain.
2. a) Explain the working of a product modulator.
b) What is quadrature-null effect? Explain.
3. Derive an expression for canonical representation of USSB signal.
4. a) Show that FM is more immune to nonlinear distortion than AM.
b) Why does FM, in general, require much larger bandwidth than AM?
5. Derive the expression for the output SNR for an ideal baseband communication system. State the assumptions involved.
6. a) Explain the operation of AM transmitter.
b) Write notes on frequency stability in FM transmitters.
7. a) Why are many RF amplifiers used in TRF receiver? Explain.
b) Explain the principle of operation of super heterodyne FM receiver.
8. a) Explain the operation of PWM generator.
b) Describe the demodulation of PPM waves.



II B. Tech II Semester Supplementary Examinations, May/June - 2015**ANALOG COMMUNICATIONS**

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Derive an expression for effective modulation index for multi-tone modulation.  
b) Describe the operation of square-law modulator.
2. a) Describe the operation of Costas loop receiver.  
b) Give the working principle of a squaring synchronizer.
3. a) Describe the filter method of SSB signal generation.  
b) Distinguish between different amplitude modulation schemes.
4. a) Give the details of the frequency and bandwidth of the signals used in commercial FM radio broadcasting. What is Carson's rule?  
b) Show how a PM signal can be demodulated using an FM demodulator.
5. Explain pre-emphasis and de-emphasis circuits.
6. a) Give the classification of radio transmitters.  
b) What is the effect of feedback on performance of AM transmitter? Explain.
7. In the context of radio receivers, define the terms:
  - a) selectivity
  - b) sensitivity
  - c) image frequency rejection ratio
  - d) Q-factor
8. Write notes on the following terms:
  - a) Dual polarity PAM
  - b) Demodulation of PWM signals



**II B. Tech II Semester Supplementary Examinations, May/June - 2015****OBJECT ORIENTED PROGRAMMING**

(Com. to CSE, CHEM, IT, ECC)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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- 1 a) Explain the following concepts of Object Oriented Programming in detail with an example
i. Data abstraction
ii. Inheritance 15M
- 2 a) Write a JAVA program to define overloaded constructors to perform string initialization, string copy and string destruction. 8M
b) Illustrate the importance of 'this' keyword with a sample JAVA program. 7M
- 3 a) What is inheritance? Explain different types inheritances in JAVA 8M
b) Explain run time polymorphism with example JAVA program. 7M
- 4 a) Give general form of the package statement. Give an example package creation statement. 8M
b) Write the differences between classes and interfaces. 7M
- 5 a) Explain Exception handling in JAVA with an example program. 8M
b) Discuss the life cycle of a thread in JAVA. 7M
- 6 a) Explain the delegation event model of handling events with a suitable program 15M
- 7 a) Explain the life cycle of an Applet. 8M
b) In what way JList differ from JComboBox? Explain. 7M
- 8 a) What is InetAddress? How to create an InetAddress and also discuss its use. 8M
b) Define Sockets? Explain various Socket classes available in JAVA for creating server applications. 7M



II B. Tech II Semester Supplementary Examinations, May/June - 2015**OBJECT ORIENTED PROGRAMMING**

(Com. to CSE, CHEM, IT, ECC)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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- 1 a) Explain the important paradigm of Object Oriented Paradigm with an important example. [8M]  
b) Explain in detail about Method Overriding and Exception handling. [7M]
- 2 a) What is a constructor? What are its special properties? How do we invoke a constructor? [8M]  
b) Write a JAVA program demonstrating the difference between method overloading and method overriding. [7M]
- 3 a) Explain in detail about the inheritance mechanism in JAVA with suitable example programs. [15M]
- 4 a) Give general form of a multileveled package statement. What is the significance of the CLASSPATH environment variable in creating/using a package? [8M]  
b) Explain how interfaces can be used to import shared constants into multiple classes. [7M]
- 5 a) What do you mean by an exception and error? Give the hierarchy of the Exceptions in java. [8M]  
b) What are the two ways of implementing threads in JAVA? Explain. [7M]
- 6 a) What are the various sources of Events? And also give the respective Event listener interfaces. [8M]  
b) Explain the importance of Inner classes with an example program. [7M]
- 7 a) What are various JFC containers? List them according to their functionality. Explain each of them with examples. [15M]
- 8 a) What are Factory methods? Explain the three commonly used InetAddress factory methods. [8M]  
b) What is an URL? What are its components and Discuss various constructors of JAVA's URL class. [7M]



**II B. Tech II Semester Supplementary Examinations, May/June - 2015****OBJECT ORIENTED PROGRAMMING**

(Com. to CSE, CHEM, IT, ECC)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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- 1 a) Explain briefly about various Object Oriented Programming concepts. [8M]
b) Explain in detail about Class, Objects, Methods and Messages. [7M]
- 2 a) Describe the concept of Pass by reference and Pass by value with an example program [8M]
b) What is a constructor? Explain various forms of constructors with suitable example. [7M]
- 3 a) Explain the use of the keyword 'super' with an example program. [8M]
b) What is polymorphism? Explain different types of polymorphism [7M]
- 4 a) What is an interface? Give the general form of an interface and also discuss the implementation details of interfaces. [8M]
b) Give the general form of the import statement. Illustrate a Java program that creates a package and uses it. [7M]
- 5 a) List out the various java built-in exception handlers [8M]
b) With a neat diagram, Explain various states of thread in JAVA. [7M]
- 6 a) Explain the syntax and functionality of different methods related to frames. [10M]
b) Explain in detail about Adapter classes with an example JAVA program. [5M]
- 7 a) Discuss the principles and architecture of Model-View-Controller. [8M]
b) Write a JAVA program which draws a dashed line and dotted line using Applet. [7M]
- 8 a) Write a JAVA program to implement simple networked communications client and server. [8M]
b) Discuss various constructors of JAVA's DatagramPacket class. [7M]



II B. Tech II Semester Supplementary Examinations, May/June - 2015**OBJECT ORIENTED PROGRAMMING**

(Com. to CSE, CHEM, IT, ECC)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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- 1 a) Discuss the advantages of Object Oriented Programming over Procedural programming. [8M]  
b) Explain in detail about Data abstraction. [7M]
- 2 a) What are objects and how they are created from class? [8M]  
b) Explain the concept of constructors and destructors in detail with an example program [7M]
- 3 a) What is the significance of inheritance? Explain various types of inheritance with suitable example [8M]  
b) Explain in detail about abstract classes with an example JAVA program. [7M]
- 4 a) Explain how packages are used to resolve naming conflicts in JAVA? With an example show how to add classes to packages and how to import packages in classes? [8M]  
b) Write a JAVA program to implement nested interfaces. [7M]
- 5 a) Explain the difference between throw and throws with an example JAVA program. [8M]  
b) Illustrate with an example, the JAVA's language-level support for synchronizing threads. [7M]
- 6 a) What are the methods supported by KeyListener interface and MouseListener interface? Explain each of them with examples. [15M]
- 7 a) Explain the steps involved in creating JCheckBox, JRadioButton, JButton and JLabel. [15M]
- 8 a) Write short notes on  
i. Applets [5M]  
ii. JFrame [5M]  
iii. Final class, final methods and final variables [5M]

