R13

II B. Tech II Semester Regular Examinations, April/May - 2016
HYDRAULICS AND HYDRAULIC MACHINERY
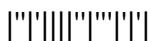(Civil Engineering)

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**
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PART –A

1. a) When do you call the flows as critical, sub critical and super critical flows?

   b) Give the advantages of Dimensional analysis.

   c) A jet of water strikes with a velocity of 40 m/s a flat plate inclined at 30^0 with the axis of the jet. If the cross sectional area of the jet is 25 cm^2 determine the force exerted by the jet on the plate.

   d) What is bondage factor?

   e) What are constant head characteristic curves?

   f) What does an indicator diagram represent?

PART –B

2. a) Find the discharge through a rectangular channel of width 2m having a bed slope of 4 in 8000. The depth of flow is 1.5m and takes the value of N in Manning's formula as 0.012.

   b) Derive dynamic equation for GVF.

3. a) What is a model and when do you call it as a distorted model and undistorted model.

   b) Explain Rayleigh's method

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4. a) A jet of water 50 mm in diameter and moving with a velocity of 26 m/s is impinging normally on a plate. Determine the pressure on the plate when it is fixed and when it is moving with a velocity of 10 m/s in the direction of the jet. Also determine the work done per second by the jet.

   b) Derive the expression for force exerted by a jet when it strikes an inclined flat plate which is moving in the same direction as the jet.

5.   A Kaplan turbine develops 2100kW under a net head of 7.2m with an overall efficiency of 87%. It is to be fitted with blow type draft tube (draft tube efficiency 88%) having its inlet 1.8m diameter. Determine how much above or below the tail race level should the draft tube inlet be set so that vacuum pressure there does not exceed 460 mm of mercury

6.   A centrifugal pump discharges 0.15 m^3/s of water against a head of 12.5m the speed of the impeller being 600 r.p.m. The outer and inner diameters of impeller are 500 mm and 250 mm respectively and the vanes are bent back at 35^0 to the tangent at exit. If the area of flow remains 0.07 m^2 from inlet to outlet calculate manometric efficiency of pump, vane angle at inlet and loss of head at inlet to impeller when the discharge is reduced by 40% without changing the speed.

7. a) Calculate the power developed in MW from a power plant with the following data. Available head 50m, catchment area 250sq.Km, Average annual rainfall 120cm, rainfall lost due to evaporation 20%, turbine efficiency 82%, generator efficiency 84% and head lost in penstock 4%.

   b) Give the classification of hydropower plants

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PART –A

1. a) Find the specific energy of flowing water through a rectangular channel of width 5m when the discharge is 10 m^3/s and depth of water is 3m.

   b) What is Euler's model law?

   c) What is impulse momentum principle?

   d) Explain the term "casing" with respect to centrifugal pump.

   e) What is Thomas cavitation factor?

   f) Give any three disadvantages of hydro electric power plants.

PART –B

2. a) Explain direct step method.

   b) The depth of flow of water at a certain section of a rectangular channel of 2m wide is 0.3m. The discharge through the channel is 1.5 m^3/s. Find whether a hydraulic jump will occur and if so find its height and loss of energy per kg of water.

3. a) Give the uses of dimensional analysis. Also explain different methods with respect to their application.

   b) A 1:10 scale model of a submarine moving far below the surface of water is tested in a water tunnel. If the speed of the prototype is 8 m/s, determine the corresponding velocity of water in the tunnel. Also determine the ratio of the drag for the model and the prototype. $\Upsilon_{sea\ water}$ =1.121x 10^{-6} m^2/s, Υ_{water} =1.00x 10^{-6} m^2/s, $\rho_{sea\ water}$ =1027 Kg/m^3, ρ_{water}=1000kg/m^3.

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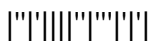
4. a) A jet of water 50 mm in diameter moving with velocity of 15 m/s impinges on a series of vanes moving with a velocity of 6m/s. Find the force exerted by the jet, work done by the jet and efficiency of the jet.

   b) A stationary vane having an inlet angle of zero degree and an outlet angle of 25^0 receives water at velocity of 50 m/s. Determine the component of force acting on it in the direction of the jet velocity and normal to it. Also find the resultant force in magnitude and direction per kg of flow.

5. A double jet pelton wheel is required to generate 7500 kilowatts when the available head at the base of the nozzle is 400m. The jet is deflected through 165^0 and the relative velocity of the jet is reduced by 15% in passing over the buckets. Determine the diameter of each jet, total flow, force exerted by the jet on buckets in tangential direction. Assume generator efficiency of 95%, overall efficiency of 80%, k_v=0.97 and k_u=0.46.

6. a) A double acting reciprocating pump running at 40r.p.m. is discharging $1.0m^3$ of water per minute. The pump has a stroke of 400 mm. The diameter of the piston is 200 mm. The delivery and suction head are 20 m and 5 m respectively. Find the slip of the pump and power required to drive the pump.

   b) Compare and contrast centrifugal and reciprocating pumps.

7. a) Give the classification of hydropower plants.

   b) Define and describe load factor and utilization factor.

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PART –A

1. a) When does a hydraulic jump occur?
    b) Give the dimensions of force, viscosity and power.
    c) Find the force exerted by a jet of water of diameter 80 mm on a stationary flat plate when the jet strikes the plate normally with velocity of 20 m/s.
    d) Why does not a draft tube have a constant cross sectional area throughout its length.
    e) What is slip and when does a negative slip occur.
    f) Give any three advantages of hydro electric power plants.

PART –B

2. a) Explain specific energy curve.
    b) A trapezoidal channel with side slopes of 3 horizontal to 2 vertical has to be designed to convey 10 m^3/s at a velocity of 1.5 m/s so that the amount of concrete lining for the bed and sides is minimum. Find the wetted perimeter and slope of the bed if Maning's N=0.014 in the formula C=$m^{1/6}$(1/N).

3. When can you apply the results of a model to prototype? Explain in detail.

4. a) A 25mm diameter jet exerts a force of 1kN in the direction of flow against a flat plate which is held inclined at an angle of 30^0 with the axis of the stream. Find the rate of flow.
    b) Give the classification of turbines.

5. a) The following data were obtained from a test on a pelton wheel: Head at the base of the nozzle=32m, discharge of the nozzle=0.18m^3/s, area of the jet=7500sq.mm, power available at the shaft=44 kW and mechanical efficiency=94%. Calculate the power lost in the nozzle, in the runner and in mechanical friction.
    b) Derive the expression for specific speed of a turbine.

6. Explain working of a centrifugal pump with neat sketch.

7. a) The following data relate to a proposed hydro electric station. Available head=28m, catchment area=420sq.km, rainfall=140cm/year, percentage of total rainfall utilised=68%, penstock efficiency=94%, turbine efficiency=80%, generator efficiency=84% and load factor=44%. Calculate the power developed.
    b) How do you estimate hydropower potential?

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PART –A

1. a) Give the distribution of velocity in an open channel.
   b) Water at 15^0C flows at 4 m/s in a 150 mm pipe. At what velocity must oil at 30^0C flow in a 75 mm pipe for the two flows to be dynamically similar. Take Υ_{water} at 15^0 C as $1.145 \times 10^{-6} m^2/s$ and that for oil at 30^0c as $3.0 \times 10^{-6} m^2/s$.
   c) Differentiate between impulse and reaction turnines.
   d) What is meant by priming?
   e) Give the role of surge tanks in hydroplants
   f) Define load factor and utilisation factor.

PART –B

2. a) What is momentum correction factor. Also derive the expression for the same.
   b) A power canal of trapezoidal section has to be excavated through hard clay at the least cost. Determine the dimensions of the channel if it has to carry a discharge of 14 m^3/s with bed slope of 1:2500 and Maning's N=0.020.

3. a) Explain any four dimensionless numbers.
   b) If the capillary rise h depends on specific weight w, surface tension σ of the fluid and the radius of the tube r show that $h/r = \Phi (\sigma/wr^2)$.

4. A jet of water having a velocity of 30 m/s impinges on a series of vanes with a velocity of 15 m/s. The jet makes an angle of 30^0 to the direction of motion of vanes when entering and leaves at an angle of 120^0. Sketch velocity triangles at entrance and exit and determine the vane angles so that the water enters and leaves without shock.

5. a) Define and differentiate unit and specific quantities.
   b) A kaplan turbine produces 60000 kW under a net head of 25 m with an overall efficiency of 90%. Taking the value of speed ratio k_u as 1.6, flow ratio Ψ as 0.5 and the hub diameter as 0.35 times the outer diameter find the diameter and speed of the turbine.

6. a) Derive the expression for minimum starting speed of a centrifugal pump.
   b) A single acting reciprocating pump running at 50 r.p.m., delivers 0.01m^3/s of water. The diameter of the piston is 200 mm and stroke length 400 mm. Determine the theoretical discharge of the pump, coefficient of discharge, slip and percentage slip of the pump.

7. What are hydro electric power plants? Also give the advantages and disadvantages.

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II B. Tech II Semester Regular Examinations, April/May - 2016
SWITCHING THEORY AND LOGIC DESIGN
(Com. to EEE, ECE, ECC, EIE)

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**
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PART –A

1.	a)	Convert the decimal number 250.5 to base 3, base 4	(4M)
	b)	Write and prove de-Morgan laws	(4M)
	c)	Implement two input EX-OR gate from 2 to 1 multiplexer	(3M)
	d)	Write the demerits of PROM	(3M)
	e)	What is race around condition? How can minimized in J-K flip-flop	(4M)
	f)	write the difference between Mealy and Moore machine	(4M)

PART -B

2.	a)	Realize an 2 input EX-OR gate using minimum number of 2 input NAND gates.	(8M)
	b)	Subtract 278_{10} from 495_{10} using the excess-3 subtractor	(4M)
	c)	Encode the decimal numbers using 6, 3, 1,-1 weighted code. Is it a self-complementing code.	(4M)
3.	a)	Simplify the logic functions from binary to seven segment display code converter	(8M)
	b)	Simplify the following using Tabular method $F(A , B , C , D , E) = \Sigma(0, 2, 4, 6, 9, 11, 13, 15, 17, 21, 25, 27, 2, 31)$	(8M)
4.	a)	Draw the logic diagram 4-bit binary adder-subtractor circuit and explain its operation	(8M)
	b)	Design full adder from 3 to 8 decoder	(8M)
5.	a)	Design and implement Full adder with PLA	(8M)
	b)	Write the comparisons between PAL, PLA	(8M)
6.		What is a shift register? Draw the block diagram and timing diagram of a shift register that shows the serial transfer of information from register A to register B.	(16M)
7.	a)	The output Z of a fundamental mode, two input sequential circuit is to change from 0 to 1 only when x_2 changes from 0 to 1 while x_1=1. The output changes from 1 to 0 only when x_1 changes from 1 to 0 while x_2=1. Find a minimum row reduced flow table	(8M)
	b)	Draw a state diagrams of a sequence detector which can detect 101	(8M)

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PART –A

1. a) Convert the following numbers to decimal   (4M)
        i) $(12121)_3$ ii) $(50)_7$
    b) Prove that $xy + x^1z + xy^1 = xy + x^1z$ (4M)
    c) Design half adder from 2 to 4 decoder   (4M)
    d) Write the merits of PROM   (3M)
    e) Write the difference counter and register   (4M)
    f) What is Moore state machine diagram   (3M)

PART –B

2. a) The message below has been coded in Hamming code. Decode the message for   (8M)
        single error detection code (message = 4 bits).1001001 0111001 1110110 0011011.
    b) Design BCD code to Gray code converter.   (8M)

3. a) Simplify the following using K-map method   (8M)
        $F(A , B , C , D , E) = \Sigma(0, 2, 4, 6, 9, 11, 13, 15, 17, 21, 25, 27, 31)$
    b) Implement the following function with NAND gates   (8M)
        $F(x , y) = \Sigma(1, 2)$

4. a) Define Multiplexer and explain the procedure to implement 32X1 MUX by Using   (8M)
        4X1 Multiplexers
    b) Design 4-bit digital comparator and explain with neat sketch   (8M)

5. a) Implement $f (A,B,C,D) = \sum(0,1,4,5,6,7,9,10,12,13,15)$ using PLA and explain its (8M)
        procedure
    b) Write the comparisons between PAL, PLA   (8M)

6. a) Draw the circuit diagram of MOD-10 Counter and explain the operation of it   (8M)
    b) What is race around condition and how to avoid it along with circuit diagram   (8M)

7. a) Explain in detail the Mealy state diagram with one example   (8M)
    b) Draw a state diagrams of a sequence detector which can detect 110   (8M)

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PART –A

1. a) Add the following numbers in give base without converting to decimal (4M)
        (i) $(1230)_4$ and $(23)_4$ (ii) $(296)_{12}$ and $(57)_{12}$
    b) Minimize below logic function with minimum number of literals (4M)
        $y (wz^1 + wz) + xy$
    c) Why do go for priority encoder rather than normal encoder (3M)
    d) Write the comparisons between PAL, PLA (4M)
    e) Write the differences between latch and flip-flop (4M)
    f) What is Mealy state diagram? (3M)

PART –B

2. a) Deduce X from the following? (8M)
        (i) $(BA0.C)_{16} = (X)_8$ (ii) $(10101100)_2 = (X)_{16}$
        (iii) $(FFE.C)_{16}=(X)_2$ (iv) $(7562)_8 = (X)_2$
    b) Subtract the following numbers using 10's complement (4M)
        (i) $5250 – 321$ (ii) $753 – 864$ (iii) $3570 – 2100$ (iv) $20 – 1000$
    c) Convert $(0011001.0101)_2$ to decimal and octal (4M)

3. a) Obtain the simplified expression in sum of products form using K-map method (8M)
        $F(A , B , C , D , E) = \Sigma(0, 1, 4, 5, 16, 17, 21, 25, 29)$
    b) Implement the following function with NAND gates (8M)
        $F(x , y , z) = \Sigma(0 , 6)$

4. a) Implement $f (A,B,C,D) = \sum(0,1,3,5,6,8,9,11,12,13)$ using 8:1 MUX and explain its procedure (8M)
    b) Design and implement Full adder with two half adder and or gate (8M)

5. a) Implement $f (A,B,C,D) = \sum(0,1,3,5,6,8,9,11,12,13)$ using PROM and explain its procedure (8M)
    b) Write the merits and demerits of PROM (8M)

6. a) With the aid of external logic, convert D type flip-flop to a JK flip-flop. (8M)
    b) Design a synchronous modulo-12 counter using NAND gates and JK flip flops (8M)

7. a) Explain the state machine capabilities and limitations in detail (8M)
    b) Draw a state diagrams of a sequence detector which can detect 010 (8M)

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PART –A

1. a) Write the first 10 numbers in base 4   (3M)
   b) Minimize below logic function with minimum number of literals   (4M)
   $(x + y)(x + y^1)$
   c) Application of full adder   (3M)
   d) Write the comparisons between ROM, PLA   (4M)
   e) Write the difference between combinational circuit and sequential circuit   (4M)
   f) Write the limitation of state machines   (4M)

PART –B

2. a) Obtain the 1's and 2's complement of the following binary numbers   (8M)
   1010101 , 0111000 , 0000001 , 10000 , 00000
   Also obtain 9's and 10's complement of the following decimal numbers
   09900 , 10000 , 00000
   b) What is a reflected code? Write about reflected codes by giving examples   (8M)

3. a) Obtain the simplified expression for the Boolean function 'F' using don't care   (8M)
   conditions 'd' in product of sums form
   $F = B^1DE^1 + A^1BE + B^1C^1E^1 + A^1BC^1D^1$
   $d = BDE^1 + CD^1E^1$
   b) Simplify the following function and implement it with NAND gates   (8M)
   $F_1 = (B^1 + D^1)(A^1 + C^1 + D)(A + B^1 + C^1 + D)(A^1 + B + C^1 + D^1)$

4. a) Implement the following Boolean function with a multiplexer   (8M)
   (i) $F(A, B, C, D) = \sum(1, 2, 5, 8, 6, 10, 12, 14)$ (ii) $F(A, B, C, D) = \sum(1, 2, 5, 6, 12)$
   b) Construct the 4 bit parallel adder with look ahead carry generation   (8M)

5. a) Implement $f(A, B, C, D) = \sum(0, 1, 3, 5, 6, 8, 9, 11, 12, 13)$ using PAL and explain its   (8M)
   procedure
   b) Write the merits and demerits of PROM   (8M)

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6. a) What is flip-flop? How can be used in sequential circuit and explain in detail   (8M)
   b) Explain about Master-slave flip-flop in detail   (8M)

7. a) Reduce the number of states in the following state table and tabulate the reduced (8M)
   state table.

PS	NS$_1$Z	
	$x=0$	$x=1$
A	D, 0	H, 1
B	F, 1	C, 1
C	D, 0	F, 1
D	C, 0	E, 1
E	C, 1	D, 1
F	D, 1	D, 1
G	D, 1	C, 1
H	B, 1	A, 1

   b) Draw a state diagrams of a sequence detector which can detect 011.   (8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
THERMAL ENGINEERING-I
(Mechanical Engineering)

Time: 3 hours
Max. Marks: 70

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PART –A

1. a) Draw p-v and T-s diagrams for air standard Otto cycle and mark various energy interactions. (4M)
   b) Draw ideal and actual valve timing diagram of a 4-s SI engine. (4M)
   c) List out various factors influencing flame speed. (3M)
   d) Explain why useful power output at the end of the shaft is called as brake power. (4M)
   e) Write detailed classification of compressors. (3M)
   f) Which types of compressors are used in air craft applications? State the reasons clearly. (4M)

PART –B

2. a) Compare and contrast the actual cycles and fuel-air cycles of S.I Engine? (8M)
   b) Is the effect of compression ratio on efficiency as same in fuel-air also? Explain. (8M)

3. a) Draw the schematic diagram of simple carburetor and explain its working principle. (8M)
   b) Differentiate between Magneto ignition system with battery coil ignition system. (8M)

4. a) Explain different stages of combustion in S.I. Engine along with p-θ diagram. (8M)
   b) What are different methods to control the knocking in S.I. Engine? Explain. (8M)

5. A four stroke petrol engine with a compression ratio of 6.5 to 1 and total piston displacement of 5.2×10^{-3} m^3 develops 100 kW brake power and consumes 33 kg of petrol per hour of calorific value 44300 kJ/kg at 3000 rpm. Find: (16M)
   i) Brake mean effective pressure,   ii) Brake thermal efficiency
   iii) Air standard efficiency ($\gamma = 1.4$); and   iv) Air-fuel ratio by mass.
   Assume a volumetric efficiency of 80 %. One kg of petrol vapour occupies 0.26 m^3 at 1.013 bar and 15^{0}C. Take R for air 287 J/kg K.

6. a) Derive an expression for the optimums inter cooler pressure for two stage reciprocating air compressors with perfect inter cooling. (8M)
   b) Differentiate between positive displacement compressors and dynamic compressors. (8M)

7. a) Draw the velocity triangles for the centrifugal compressor and derive the equation for the estimation of power required to compress the air. (8M)
   b) Define and explain the terms pressure coefficient and adiabatic coefficient of a centrifugal compressor. (8M)

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THERMAL ENGINEERING-I
(Mechanical Engineering)

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PART –A

1. a) Draw p-v and T-s diagrams for air standard Diesel cycle and mark various energy interactions.   (4M)
    b) Draw ideal and actual port timing diagram of a 2-s SI engine.   (4M)
    c) List out various factors influencing delay period.   (3M)
    d) Write the importance of heat balance sheet.   (4M)
    e) Out of isothermal and adiabatic compression process, which of the processes consume less work done? Why?   (4M)
    f) Draw inlet and outlet velocity triangles of an axial flow compressors.   (3M)

PART -B

2. a) What is the significance of stroke to bore ratio on IC Engine performance? Explain.   (8M)
    b) Why the actual cycle efficiency is much lower than the air standard cycle   (8M)
       efficiency? List the major losses in the actual engine.

3. a) Why the fuel injection system is required in C.I Engine?   (8M)
    b) What are the important requirements of fuel injection system in a C.I Engine? (8M)

4. a) What is detonation in C.I. Engine? Explain the phenomenon of detonation and its ill effects on engine performance.   (8M)
    b) What is abnormal combustion in S.I. Engine? Compare the abnormal combustion   (8M)
       with normal combustion.

5. a) A diesel engine has a compression ratio of 14 to 1 and the fuel supply is cut off at 0.08 of the stroke. If the mass of the fuel is 0.26 kg/kWh, having calorific value of 43700 kJ/kg. Determine the relative efficiency of the engine.   (8M)
    b) Explain Willan's line method of determination of frictional power   (8M)

6. a) Derive the expression for the volumetric efficiency of a reciprocating air compressor in terms of clearance ratio, pressure ratio and index of the compression.   (8M)
    b) Compare and differentiate among the fan, blower and compressor.   (8M)

7. a) Define the term slip factor and power input factor with respect to the centrifugal compressor. Explain them.   (8M)
    b) Draw the schematic diagram of axial flow air compressor and explain its working (8M)
       along with velocity triangles.

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THERMAL ENGINEERING-I
(Mechanical Engineering)

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PART –A

1. a) What is loss due to gas exchange process? (4M)
    b) What is supercharging? Explain. (4M)
    c) Explain octane rating of fuels. (4M)
    d) What are different methods used to determine air flow rate? Write the formula, (3M)
    when orifice meter is used.
    e) Explain how intercooling reduce work input to the compressor. (4M)
    f) What is the function of a diverging passage in a centrifugal casing? (3M)

PART -B

2. a) Explain with the help of p-v diagram the loss due to variation of specific heats in (8M)
    Otto cycle?
    b) Derive the expression for air standard efficiency of Otto cycle. (8M)

3. a) What are the major differences between S.I. Engine and C.I. Engine? Explain (8M)
    them with suitable examples
    b) Explain the need and importance of cooling in an I.C. Engine (8M)

4. a) Define the term flame velocity? Explain the influence of different operating (8M)
    parameters on flame propagation in S.I. Engine combustion.
    b) What is the difference between physical delay and chemical delay? Explain its (8M)
    importance.

5. a) The following date was recorded during testing of a four stroke cycle gas engine. (8M)
    Area of indicator diagram = 900 mm^2; Length of indicator diagram = 70 mm;
    spring scale = 0.3 bar/mm; Diameter of piston = 200 mm; Length of stroke = 250
    mm; Speed = 300 rpm. Determine   i) Indicated mean effective pressure
    ii) Indicated power
    b) What is the use of heat balance sheet of an engine? Mention the various items to (8M)
    be determined to complete the heat balance sheet.

6. A single stage single acting reciprocating air compressor with 0.3 m bore and 0.4 (16M)
    m strokeruns at 400 rpm. The suction pressure is 1 bar at 300 K and the delivery
    pressure is 5 bar. Find the power required to run it, if the compression is
    isothermal, adiabatic and compression follow $pv^{1.3}$ = C. Also find the isothermal
    efficiency.

7. a) What is positive displacement compressor? Explain the working principle of (8M)
    Vane sealed compressor.
    b) What are different losses occurring in the centrifugal compressor due to different (8M)
    blade shapes? Explain.

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II B. Tech II Semester Regular Examinations, April/May - 2016
THERMAL ENGINEERING-I
(Mechanical Engineering)

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**

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PART –A

1. a) Draw p-v and T-s diagrams for air standard Dual cycle and mark various energy interactions. (3M)
   b) What is valve overlap period? Explain its significance. (4M)
   c) Explain Cetanerating of fuels. (4M)
   d) List out various methods used to determine friction power of an IC engine? Which of those you think, will give more accurate results. (4M)
   e) Will it be possible to increase volumetric efficiency of compressor beyond 100%? Why? (3M)
   f) Draw neat sketch of roots blower and p-v diagram for compression through it. (4M)

PART -B

2. a) Discuss the differences between fuel-air and actual cycles. (8M)
   b) Write a note in Exhaust blowdown losses. (8M)

3. Illustrate the constructional details of an I.C engines? Explain briefly about the important components and its materials? (8M)

4. a) Explain the phenomena of detonation in S.I. Engine? What are different parameters   influence the knocking in S.I. Engine. (8M)
   b) Explain the influence of turbulence and speed on delay period in C.I. Engine combustion. (8M)

5. A twin-cylinder two-stroke engine has a swept volume of 150 cm^3. The maximum power output is 19 kW at 11000 rpm, bsfc is 0.11 kg/MJ and the air/fuel ratio is 12. If ambienttest conditions were 10^{0}C and 1.03 bar and the fuel has a calorific value of 44 MJ/kg, Calculate the bmep, overall efficiency and the volumetric efficiency. (8M)

6. a) Draw the T-s diagram for the multi stage compression and show the work saving during the compression in comparison with single stage reciprocating air compression. (8M)
   b) Explain how the use of intermediate pressure for minimum work results in equal pressure ratios in the two stages of compression, equal discharge temperatures, and equal work for the two stages. (8M)

7. a) Explain the working principle of Roots blower with suitable diagrams. (8M)
   b) What are different parameters influence the performance of the centrifugal compressors? Explain. (8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
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**

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PART –A

1.	a)	What is the significance of Java's byte code?	(3M)
	b)	List the various ways of 'static' keyword usage.	(4M)
	c)	Differentiate class, abstract class and interface.	(3M)
	d)	How does Java support inter thread communication?	(4M)
	e)	What are the differences between applet and application programs?	(4M)
	f)	Give an overview of JButton class	(4M)

PART –B

2.	a)	What are the drawbacks of procedural languages? Explain the need of object oriented programming with suitable program.	(10M)
	b)	Discuss the lexical issues of Java.	(6M)
3.	a)	Illustrate constructor overloading.	(8M)
	b)	Explain precedence rules and associativity concept	(8M)
4.	a)	With suitable code segments illustrate various uses of 'final' keyword.	(8M)
	b)	How to handle multiple catch blocks for a nested try block? Explain with an example.	(8M)
5.	a)	Describe Java's thread model.	(7M)
	b)	What is a stream? What is the difference between byte streams and character streams? How are they used to capture input from the user?	(9M)
6.	a)	What is the role of event listeners in event handling? List the Java event listeners	(8M)
	b)	Write an applet to display the mouse cursor position in that applet window.	(8M)
7.	a)	Discuss various AWT containers with examples.	(8M)
	b)	Construct an application to explain the use of JTabbedPane.	(8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
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**

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PART –A

1.	a)	Compare inheritance with polymorphism	(4M)
	b)	Write about garbage collection	(3M)
	c)	Give the basic keywords used in exception handling.	(4M)
	d)	List the thread states and give state transition diagram	(4M)
	e)	What is an adapter class? Give any two examples for it.	(3M)
	f)	Differentiate between swing components and AWT components.	(4M)

PART –B

2.	a)	Compare procedural languages with object oriented languages	(8M)
	b)	Explain the important features of Java.	(8M)
3.	a)	List various types of statements and quote suitable examples for each type.	(9M)
	b)	With a program illustrate the use of command line arguments.	(7M)
4.	a)	Explain multilevel inheritance with the help of abstract class in your program.	(8M)
	b)	How to define a user exception in a program? Illustrate with an example.	(8M)
5.	a)	Write a program to implement multi thread programming.	(10M)
	b)	Explain thread synchronization	(6M)
6.	a)	Explain delegation event model in detail.	(8M)
	b)	Write an applet to display a smiley with a greeting message to the user.	(8M)
7.	a)	What is the significance of Layout managers? Discuss briefly various layout managers.	(10M)
	b)	Write a note on split Pane.	(6M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
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**

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PART –A

1.	a)	List the applications of object oriented programming. (3M)
	b)	Illustrate the usage of 'this' keyword. (4M)
	c)	How to create and use a package in Java program? (4M)
	d)	Write about thread suspension and resume (3M)
	e)	Compare nested class with inner class. Give examples for each (4M)
	f)	Differentiate between grid layout and gridbag layout managers. (4M)

PART –B

2. a) Discuss the principles of object oriented languages in detail.   (10M)
    b) What is the role and responsibility of JVM in program execution?   (6M)

3. a) What are the primitive data types in Java? Write about type conversions.   (8M)
    b) What is a constructor? What is its requirement in programming? Explain with program.   (8M)

4. a) Write a program to implement multiple inheritances.   (8M)
    b) What is an exception? How are exceptions handled in Java programming? Explain   (8M)

5. a) Describe the need of thread synchronization. How is it achieved in Java programming? Explain with a suitable program.   (10M)
    b) Differentiate between FileReader and BufferReader.   (6M)

6. a) What is an applet? Explain its life cycle.   (8M)
    b) Write a program to handle mouse events and mouse motion events.   (8M)

7. a) Write a program to create a frame for a simple arithmetic calculator using swing components and layout mangers.   (10M)
    b) Compare the features of Applet with JApplet.   (6M)

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SET - 4

II B. Tech II Semester Regular Examinations, April/May - 2016
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**

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PART –A

1. a) Differentiate between abstraction and information hiding. (4M)
    b) What are the naming conventions for Java identifiers? (4M)
    c) What is an assertion? What is its use in programming? (3M)
    d) Define thread. How is it different from a process? (3M)
    e) Give the sources of action event and item event (4M)
    f) List the features of Menu component of AWT. (4M)

PART –B

2. a) List and explain Java buzzwords. Which factors are making Java famous
       language? (10M)
    b) Give the program structure of Java. (6M)

3. a) How to create objects? Does Java support object destruction? Justify your answer. (8M)
    b) Write a Java program to find the sum of the squares of the diagonal elements of a
       square matrix. (8M)

4.   What are the benefits of inheritance? Explain various forms of inheritance with
       suitable code segments. (16M)

5. a) Explain thread life cycle and thread creation in Java. (8M)
    b) Write a program to read user name from console and display some message for
       that user using streams. (8M)

6. a) Discuss the applet structure and compare it with application structure. (8M)
    b) Write a program to handle keyboard events. (8M)

7. a) Construct a frame with necessary components for bus reservation system of an
       agent. (10M)
    b) Write a note on dialog box usage in user interfaces. (6M)

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