R13

SET - 1

II B. Tech II Semester Regular Examinations, April/May – 2016
CONCRETE TECHNNOLOGY
(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) What is alkali aggregate reaction?	(4M)
	b) What is segregation and bleeding?	(4M)
	c) What is water cement ratio and Abram's law?	(4M)
	d) What is creep of concrete?	(3M)
	e) What is durability of concrete?	(3M)
	f) What is FRC? What are the different types of fibres?	(4M)

PART –B

2. a) Write about retarders, accelerators and plasticizers.   (8M)
    b) Write about gap graded and well graded aggregate.   (8M)

3. a) Define workability. What are the different methods for measuring the   (10M)
       workability?
    b) What are the different steps in the manufacture of concrete?   (6M)

4. a) What are the different tests of hardened concrete?   (10M)
    b) What are the factors affecting the strength?   (6M)

5. a) What is the relation between creep and time of concrete?   (8M)
    b) What are the different types of shrinkage?   (8M)

6. Design a concrete mix for characteristic strength of 30MPa at 28 days with a   (16M)
    standard deviation of 4MPa.The specific gravity of FA and CA are 2.60 and 2.70
    respectively. A slump of 50mm is necessary. The specific gravity of cement is
    3.15.Assuming the necessary data design the mix as per IS code method.

7. Write about   (16M)
    (a) Light weight aggregate concrete
    (b) Self consolidating concrete
    (c) Nofines concrete

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Code No: RT22015

R13

SET - 2

II B. Tech II Semester Regular Examinations, April/May – 2016
CONCRETE TECHNNOLOGY
(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) What are the different types of tests for finding the physical properties of cement? (4M)
   b) What is shotcrete concrete? (3M)
   c) What is maturity concept? (4M)
   d) What is the modulus of elasticity and dynamic elasticity of concrete? (4M)
   e) What is the quality control of concrete? (3M)
   f) What are the different types of polymer concretes? (4M)

PART –B

2. a) Write about bulking of aggregate and soundness of aggregate. (8M)
   b) What are the different types of admixture? Write about flyash and silica fume, (8M)

3. a) Define workability and what are the factors affecting workability? (8M)
   b) What are the steps in the manufacture of concrete? (8M)

4. a) What is the relation between compressive strength and tensile strength of concrete? (10M)
   b) What are the different NDT tests? (6M)

5. a) What is creep of concrete and what are the factors affecting creep? (10M)
   b) What are the different factors affecting shrinkage of concrete? (6M)

6. Design a concrete mix for characteristic strength of 35MPa at 28 days with a standard deviation of 4MPa.The specific gravity of FA and CA are 2.65 and 2.75 respectively. A slump of 40mm is necessary. The specific gravity of cement is 3.15.Assuming the necessary data design the mix as per IS code method. (16M)

7. Write about (16M)
   (a) High desnsity concrete
   (b) Self healing concrete
   (c) Nofines concrete

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II B. Tech II Semester Regular Examinations, April/May – 2016
CONCRETE TECHNNOLOGY
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
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PART –A

1.	a)	What is setting time of cement and how is it found practically?	(4M)
	b)	What is curing of concrete?	(3M)
	c)	What is gel space ratio?	(3M)
	d)	What is creep of concrete? What are the factors affecting creep?	(4M)
	e)	What are the acceptance criteria for a mix design?	(4M)
	f)	What is fibre reinforced concrete?	(4M)

PART –B

2.	a)	What is the effect of particle shape and texture on the strength of the aggregate?	(8M)
	b)	What are admixtures? Write about chemical admixtures and mineral admixtures.	(8M)
3.	a)	What is segregation and bleeding of concrete?	(6M)
	b)	What are the factors effecting workability?	(10M)
4.	a)	Write about split tensile strength and flexural strength of concrete?	(8M)
	b)	What are the different NDT tests? What are the codal provisions?	(8M)
5.	a)	What is the relation between creep and time?	(8M)
	b)	What are the factors affecting creep of concrete?	(8M)
6.		Design a concrete mix for characteristic strength of 25MPa at 28 days with a standard deviation of 4MPa.The specific gravity of FA and CA are 2.62 and 2.74 respectively. A slump of 40mm is necessary. The specific gravity of cement is 3.12.Assuming the necessary data design the mix as per IS code method.	(16M)
7.		Write about (a) High performance concrete (b) Self compacting concrete (c) SIFCON	(16M)

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II B. Tech I Semester Regular Examinations, April/May – 2016
CONCRETE TECHNNOLOGY
(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) What are the thermal properties of aggregates? (3M)
   b) What is ready mixed concrete? (4M)
   c) What is water cement ratio? (4M)
   d) Write about Poisson's ratio of concrete. (3M)
   e) What are the different factors in the choice of mix proportions? (4M)
   f) What is shotcrete concrete? (4M)

PART -B

2. a) Write about bulk density and moisture absorption of aggregates? (8M)
   b) What are different types of cement? What is hydration of cement? (8M)

3. a) What are the properties of fresh concrete? What are the different tests of workability? (12M)
   b) Write about water used in concrete? (4M)

4. What the different tests are of hardened of concrete? Explain in detail. (16M)

5. Write about elasticity, creep and shrinkage of concrete. (16M)

6. Design a concrete mix for characteristic strength of 30MPa at 28 days with a standard deviation of 4MPa.The specific gravity of FA and CA are 2.65 and 2.75 respectively. A slump of 60mm is necessary. The specific gravity of cement is 3.15.Assuming the necessary data design the mix as per IS code method. (16M)

7. Write about (16M)
   (a) High Density concrete
   (b) Self compacting concrete
   (c) Cellular concrete.

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II B. Tech II Semester Regular Examinations, April/May – 2016
POWER SYSTEMS - I
(Electrical and Electronics 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) Define the function of Economizer?	(4M)
	b) What is meant by chain reaction?	(4M)
	c) Define the design features of distribution systems?	(4M)
	d) What are the Advantages of Gas insulated substations?	(3M)
	e) Define the Capacitance grading?	(3M)
	f) Define (i) Maximum demand and (ii) Demand factor.	(4M)

PART –B

2.	a) Explain the function of Boilers and Super heaters in thermal power plants?	(8M)
	b) Explain the factors to be considered for the selection of the site for a thermal power station?	(8M)
3.	a) Explain the classification of nuclear reactor and briefly discuss about each one.	(8M)
	b) Explain about the pressurized water reactor with neat sketch?	(8M)
4.	a) Explain about the different types of distribution systems.	(8M)
	b) List out the Comparisons between AC and DC distribution systems.	(8M)
5.	a) Explain about the 33/11 kV substation showing the location of all the substation equipments.	(8M)
	b) Explain the merits and demerits of indoor substations over outdoor substations.	(8M)
6.	a) Explain classification of cables and discuss their general construction with neat sketch.	(8M)
	b) Explain the purpose of using inter sheaths in a cable.	(8M)
7.	a) Define the following with respect to the economic aspects of power generation. i) Connected load ii) Load factor iii) Plant capacity factor	(8M)
	b) Calculate the generating cost per kWH, delivered from a generating station from the following data. Plant capacity 500 MW; annual load factor 45 %; capital cost Rs.1200×10^6; annual cost of fuel etc Rs.160 × 10^6, interest 9.2 % per annum of initial value.	(8M)

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II B. Tech II Semester Regular Examinations, April/May – 2016
POWER SYSTEMS - I
(Electrical and Electronics 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) Define the function of super heaters?   (3M)
   b) What is the function of Control rods?   (3M)
   c) Draw the line diagram of radial DC distributor fed at one end with equal loads?   (4M)
   d) What are the merits and demerits of the double bus bar with one circuit breaker?   (4M)
   e) What is the need of the Inter sheath grading?   (4M)
   f) Define the (i) Simple rate (ii) Flat Rate and (iii) Block-Rate.   (4M)

PART -B

2. a) Explain the functions of Cooling tower and condenser with respect to a thermal power station.   (8M)
   b) What is feed water? What are the problems associated due to impurities in feed water? How they can be eliminated.   (8M)

3. a) Describe the Boiling water reactor (PWR) with neat diagram.   (8M)
   b) Explain the methods of producing nuclear reaction? What is chain reaction?   (8M)

4. a) List the advantages of ring mains system of distribution over the radial system.   (8M)
   b) A DC ring main ABCDA is fed from point A with 230 V supply and the loop resistances of various sections are AB = 0.04 ohms; BC = 0.35 ohms; CD = 0.5 ohms and DA = 0.05 ohms. The main supplies 100 A at B, 150A at C and 200 A at D. Calculate the voltages at each load point. If the points A and C are inter connected through a link of 0.05 ohm.   (8M)

5. a) Explain in detail about the distribution feeder fed from both ends with equal voltages and derive the expressions for voltage drop of each section.   (8M)
   b) Explain with a neat lay out diagram of a single bus bar arrangement and list its merits and demerits.   (8M)

6. a) A single core cable has a conductor diameter of 2.5 cm and a sheath of inside diameter 6cm.Calculate the maximum stress. It is desired to reduce the maximum stress by using two inters heaths. Determine their best position, the maximum stress and the voltage on each. Consider the System voltage as 3-phase 66 kV.   (8M)
   b) Explain about the different insulating materials in detail.   (8M)

7. a) Explain Two-part tariff and compare it with power factor tariff.   (8M)
   b) A generating station has a maximum demand of 500 MW. The annual load factor is 50 and capacity factor is 40 %. Find the reserve capacity of the plant.   (8M)

II B. Tech II Semester Regular Examinations, April/May – 2016
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(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

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        2. Answer **ALL** the question in **Part-A**
        3. Answer any **THREE** Questions from **Part-B**
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PART –A

1. a) Write function of electrostatic precipitators. (4M)
   b) Define the principle of nuclear fission. (4M)
   c) Draw the line diagram of radial distribution system. (4M)
   d) What are the limitations of Indoor substation? (3M)
   e) What is the capacitance grading of the cable. (3M)
   f) Define (i) Load factor and (ii) Diversity factor. (4M)

PART –B

2. a) Explain with a neat lay out diagram with main parts and the working of a steam power station. (8M)
   b) What are the limitations of a thermal power plant? (8M)

3. a) Explain the Basic components of a Nuclear reactor with a neat diagram. (8M)
   b) List the advantages and disadvantages of a Fast breeder reactor (FBR). (8M)

4. a) What is an inter connector? Discuss its advantages in a distribution system. (8M)
   b) Explain about the stepped distributor with neat diagram. (8M)

5. a) Explain the factors to be considered when selecting a location for a substation. (8M)
   b) What are the factors to be considered for selecting bus bars? (8M)

6. a) Show that in a 3-core (belted type) cable the neutral capacitance of each conductor C_n is equal to $C_S + 3C_C$, where C_S and C_C are the capacitances of each conductor to sheath and to each other respectively. And further explain how these capacitances can be measured experimentally. (8M)
   b) Explain about capacitance grading of the cable in detail. (8M)

7. a) Define the following with respect to the economic aspects of power generation
   i) Load duration curve, ii) Demand factor, iii) Diversity factor and
   iv) Maximum demand (8M)
   b) Explain the terms load factor and diversity factor and discuss their effect on the cost of generation of electrical energy. (8M)

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II B. Tech II Semester Regular Examinations, April/May – 2016
POWER SYSTEMS - I
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

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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 need of condenser in thermal plants	(4M)
	b)	Write Short notes on Radiation hazards and shielding in nuclear power stations.	(4M)
	c)	Describe the design features of distribution systems?	(4M)
	d)	Draw the line diagram of Air insulated substation.	(3M)
	e)	Derive the expressions for P.f of cable	(3M)
	f)	What is the significance of load factor and diversity factor?	(4M)

PART –B

2.	a)	Explain about the Different types of Boilers in details with neat sketch.	(8M)
	b)	Explain about the classifications of pulverizing mills.	(8M)
3.	a)	Write short notes on Reflectors and Coolants in nuclear reactors.	(8M)
	b)	Explain the structure of an atom. What is the difference between atomic number and mass number and also mention their relevance in nuclear reaction.	(8M)
4.	a)	Find the power loss equation for DC distributor fed at one end-uniformly loading system.	(8M)
	b)	Explain about the comparisons between comparison of DC and AC distribution.	(8M)
5.	a)	Explain about main and transfer bus bar system with relevant diagrams.	(8M)
	b)	List the advantages and disadvantages of Gas-insulated substation.	(8M)
6.	a)	Explain about the Grading of cables in detail.	(8M)
	b)	Find the most economical diameter of a single core cable to be used on a 132 kV, 3-phase system. Find also the overall diameter of the insulation if the peak permissible stress is not to exceed 60 kV per cm.	(8M)
7.	a)	A consumer has a maximum demand of 200KW, maintain 1 load factor of 40%.The tariff rates are Rs 100 per KW of maximum demand plus 10 paisa per Kwh, Find (i) total energy consumed per annum (ii) The annual electricity bill.	(8M)
	b)	Define the following terms (i) Flat rate tariff, (ii) Maximum demand, (iii) Average load and (iv) Simple tariff.	(8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
FLUID MECHANICS AND HYDRAULIC MACHINERY
(Com. to ME, AME)

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) Explain atmospheric, gauge and vacuum pressure.   (4M)
    b) Describe the condition for Irrotational flow.   (3M)
    c) What is a bluff body? What is its application?   (4M)
    d) What are the velocity triangles? Draw them and explain.   (4M)
    e) What is NPSH? Explain.   (4M)
    f) Discuss the applications of sensors and oscillators.   (3M)

PART -B

2. a) Define the following fluid properties:
        Density, weight density, specific volume and specific gravity of a fluid.   (8M)
    b) An oil film of thickness 1.5 mm is used for lubrication between a square plate of   (8M)
        size 0.9 m × 0.9 m and an inclined plane having an angle of inclination 20^0 . The
        weight of the square plate is 392.4 N and it slides down the plane with a uniform
        velocity of 0.2 m/s. Find the dynamic viscosity of the oil.

3. a) Define the equation of continuity. Obtain an expression for continuity equation for   (8M)
        a one dimensional flow
    b) Water is flowing through a pipe having diameters 30 cm and 15 cm at the bottom   (8M)
        and upper end respectively. The intensity of pressure at the bottom end is 29.43
        N/cm^2 and the pressure at the upper end is 14.715 N/cm^2. Determine the difference
        in datum head if the rate of flow through pipe is 50 lit/s.

4. a) What is boundary layer separation? Explain the control of it.   (8M)
    b) Distinguish among geometric, kinematic and dynamic similarities.   (8M)

5. a) Find the expression for the force exerted by the jet on a flat vertical plate moving   (8M)
        in the direction of the jet.
    b) A jet of diameter 150mm strikes a flat plate normally with a velocity of 20m/sec.   (8M)
        The plate is moving with a velocity of 5m/sec in the direction of the jet and away
        from the jet. Find
        i) The force exerted by the jet on the plate
        ii) Work done by the jet on the plate per second

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6. a) Define a centrifugal pump. Explain the working of a single-stage centrifugal pump with sketches.   (8M)

   b) The internal and external diameters of the impeller of a centrifugal pump are 300 mm and 600 mm respectively. The pump is running at 1000 r.p.m. The vane angles at inlet and outlet are 20^0 and 30^0 respectively. The water enters the impeller radially and velocity of flow is constant. Determine the work done by the impeller per unit weight of water.   (8M)

7. a) What do you mean by gross head, net head and efficiency of turbine? Explain the different types of efficiencies of a turbine.   (8M)

   b) A Pelton wheel has a mean bucket speed of 35 m/s with a jet of water flowing at the rate of 1 m^3/s under a head of 270 m. The buckets deflect the jet through an angle of 170°. Calculate the power delivered to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.98.   (8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
FLUID MECHANICS AND HYDRAULIC MACHINERY
(Com. to ME, AME)

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) Distinguish between floating body and submerged body.   (4M)
    b) Explain HGL and TEL with the help of a neat sketch.   (4M)
    c) Explain what dynamic similarity is.   (3M)
    d) What is hydrodynamic force? Explain.   (3M)
    e) Explain the working principle of Reciprocating pump.   (4M)
    f) What is meant by governing of a turbine? When it is required.   (4M)

PART -B

2. a) What is metacentric height? Derive the expression for it.   (8M)
    b) In a stream of glycerine in motion, at a certain point the velocity gradient is 0.25 (8M)
        metre per sec per metre. The mass density of fluid is 1268.4 kg per cubic metre
        and kinematic viscosity is $6.30 \times 10{-4}$ square metres per second. Calculate the
        shear stress at the point.

3. a) Explain the terms: (8M)
        (i) Path line   (ii) Streak line
        (iii) Stream line,   (iv) Stream tube.
    b) A 40 cm diameter pipe, conveying water, branches into two pipes of diameter 30 (8M)
        cm and 20 cm respectively. If the average velocity in the 40 cm diameter pipe is 3
        m/s, find the discharge in this pipe. Also determine the velocity in 20 cm pipe if
        the average velocity in 30 cm diameter pipe is 2 m/s.

4. a) What do you mean by boundary layer separation? What is the effect of pressure   (8M)
        gradient on boundary layer separation?
    b) Define the following dimensionless numbers with their suitability: (8M)
        (i) Reynold's Number
        (ii) Weber Number.

5. a) Derive an expression for the force exerted by a jet of water on an inclined fixed (8M)
        plate in the direction of the jet.
    b) A jet of water of diameter 50mm moving with a velocity of 20m/sec strikes a fixed (8M)
        plate in such a way that the angle between the jet and the plate is $60^{0.}$
        Find the force exerted by the jet on the plate.
        i) In the direction normal to the plate. ii) In the direction of the jet.

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6. a) Differentiate between the volute casing and vortex casing for the centrifugal pump with the aid of neat sketches. (8M)

b) A centrifugal pump is running at 1000 r.p.m. The outlet vane angle of the impeller is 30^0 and velocity of flow at outlet is 3 m/s. The pump is working against a total head of 30 m and the discharge through the pump is $0.3 m^3/s$. If the manometric efficiency of the pump is 75 %, determine: (i) the diameter of the impeller, and (ii) the width of the impeller at outlet. (8M)

7. a) How will you classify the turbines? What is the basis for classification? Explain in detail. (8M)

b) A Pelton wheel is to be designed for the following specifications. (8M)

Power = 735.75 kW S.P, Head = 200 m, Speed = 800 r.p.m., $\eta_\circ = 0.86$ and jet diameter is not to exceed one-tenth the wheel diameter. Determine: (i) Wheel diameter, (ii) The number of jets required, and (iii) Diameter of the jet. Take $C_v=0.98$ and speed ratio =0.45.

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II B. Tech II Semester Regular Examinations, April/May - 2016
FLUID MECHANICS AND HYDRAULIC MACHINERY
(Com. to ME, AME)

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)	What is Pascal's law? Explain.	(4M)
	b)	Distinguish circulation and vorticity.	(4M)
	c)	Explain momentum integral equation.	(3M)
	d)	Analyze the flow over radial vanes.	(4M)
	e)	What is specific speed of a pump? Give the equation for it.	(3M)
	f)	What do you mean by characteristic curves of turbines?	(4M)

PART -B

2. a) What is the difference between dynamic viscosity and kinematic viscosity. State (8M) their units of measurements.

    b) Two plates are placed at a distance of 0.15 mm apart. The lower plate is fixed (8M) while the upper plate having surface area 1.0 m^2 is pulled at 0.3 m/s. Find the force and power required to maintain this speed, if the fluid separating them is having viscosity of 1.5 poise.

3. a) Distinguish between: (i) Steady flow and un-steady flow, (ii) Uniform and non- (8M) uniform flow, (iii) Compressible and incompressible flow, (iv) Rotational and irrigational flow (v) Laminar and turbulent flow.

    b) A pipe, through which water is flowing, is having diameters 40 cm and 20 cm at (8M) the cross-sections 1 and 2 respectively. The velocity of water at section 1 is 5.0 m/s. Find the velocity head at the sections 1 and 2 and also rate of discharge.

4. a) What are the boundary conditions that must be satisfied by a given velocity profile (8M) in laminar boundary layer flows? Explain.

    b) Define the following dimensionless numbers with their suitability: (8M)
       (i) Froude's Number
       (ii) Euler's Number

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5. a) Derive an expression for the hydraulic efficiency when a liquid jet strikes a single moving curved vane. (8M)

   b) A jet of water 75 mm diameter strikes a curved plate at its center with a velocity of 20m/sec. The curved plate is moving with a velocity of 8m/sec in the direction of the jet. The jet is deflected through an angle of 165^0. Assuming the plate to be smooth, find the force exerted on the plate in the direction of the jet, power of the jet and efficiency (8M)

6. a) What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of a centrifugal pump? (8M)

   b) The diameter of an impeller of a centrifugal pump at inlet and outlet are 300 mm and 600 mm respectively. The velocity of flow at outlet is 2.5 m/s and vanes are set back at an angle of 45^0 at outlet. Determine the minimum starting speed of the pump if the Manometric efficiency is 75%. (8M)

7. a) What are the uses of a draft tube. Describe with neat sketches, different types of draft tubes. (8M)

   b) A Kaplan turbine working under a head of 15 m develops 7357.5 kW shaft power. The outer diameter of the runner is 4 m and hub diameter 2 m. The guide blade angle at the extreme edge of the runner is 30°. The hydraulic and overall efficiencies of the turbine are 90% and 85% respectively. If the velocity of whirl is zero at outlet, determine: (i) runner vane angles at inlet and outlet at the extreme edge of the runner and (ii) speed of the turbine. (8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
FLUID MECHANICS AND HYDRAULIC MACHINERY
(Com. to ME, AME)

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) Write a note on classification of manometers.   (4M)
    b) Distinguish between stream function and velocity potential function.   (4M)
    c) Distinguish between stream lined body and bluff body.   (4M)
    d) Draw inlet and outlet velocity triangles for any specific case and explain it. (4M)
    e) Explain what an indicator diagram is.   (3M)
    f) Describe the working principle of hydraulic lift.   (3M)

PART -B

2. a) Differentiate between: (i) Liquids and gases, (ii) Real fluid and ideal fluids,   (8M)
    (iii) Specific weight and specific volume of a fluid.
    b) Determine the intensity of shear of an oil having viscosity = 1.2 poise and is used   (8M)
    for lubrication in the clearance between a 10 cm diameter shaft and its journal
    bearing. The clearance is 1.0 mm and shaft rotates at 200 r.p.m

3. a) Derive an expression for head loss due to friction.   (8M)
    b) The water is flowing through a pipe having diameters 20 cm and 15 cm at sections   (8M)
    1 and 2 respectively. The rate of flow through pipe is 40 litres/s. The section 1 is 6
    m above datum line and section 2 is 3 m above the datum. If the pressure at
    section 1 is 29.43 N/cm^2, find the intensity of pressure at section 2.

4. a) Define physically and mathematically the concept of displacement, momentum   (8M)
    and energy thickness of a boundary layer.
    b) What do you mean by dimensionless number? What is its significance in the flow   (8M)
    analysis?

5. a) Derive an expression for the force exerted by a jet of water striking normally a   (8M)
    moving vertical plate.
    b) A jet of water of diameter 50 mm having a velocity of 20m/sec strikes a curved   (8M)
    vane which is moving with a velocity of 10m/sec in the direction of the jet. The jet
    leaves the vane at an angle of 60^0 to the direction of motion of the vane at outlet.
    Determine.
    (i) The force exerted by the jet on the vane in the direction of motion and
    (ii) Work done per second by the jet.

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6. a) Define the terms: suction head, delivery head, static head and manometric head.   (8M)
   b) Find the rise in pressure in the impeller of a centrifugal pump through which water   (8M)
      is flowing at the rate of 15 litre/s. The internal and external diameters of the
      impeller are 20 cm and 40 cm respectively. The widths of impeller at inlet and
      outlet are 1.6 cm and 0.8 cm. The pump is running at 1200 r.p.m.The water enters
      the impeller radially at inlet and impeller vane angle at outlet is 30^0 . Neglect
      losses through the impeller.

7. a) Differentiate between: (i) The impulse and reaction turbines, (ii) Radial and axial   (8M)
      flow turbines, (iii) Inward and outward radial flow turbines, and (iv) Kaplan and
      propeller turbines.
   b) A Pelton wheel is having a mean bucket diameter of 0.8 m and is running at 1000   (8M)
      r.p.m. The net head on the Pelton wheel is 400 m. If the side clearance angle is 15°
      and discharge through nozzle is 150 litres/s, find :
      (i) Power available at the nozzle, and (ii) Hydraulic efficiency of the turbine.

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II B. Tech II Semester Regular Examinations, April/May – 2016
MANAGEMENT SCIENCE
(Electronics and Communications 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) Define Motivation and explain the theories of motivation? (4M)
   b) Explain the concept of TQM (Total Quality Management) (4M)
   c) What are the different functional areas of management, enlist different functions (4M)
      of management that are used in each of the scope area.
   d) List different steps involved in Corporate Planning Process for ITES Sector. (4M)
   e) What are ethics and list types of ethics that are necessary for an engineer? (3M)
   f) Steps in Business Process Reengineering? List few examples for BPRs. (3M)

PART –B

2. a) List & Explain Various Functions of Management in General? (8M)
   b) Define the work study? Explain work-study methods? (8M)

3. a) List different functions of finance and also explain how managerial functions (8M)
      helpful for efficient & effective use of financial resources?
   b) Compare Vision, Mission, Strategies & Goals in its importance, also write model (8M)
      statements suitable for a Manufacturer of Electronics Components?

4. a) Why Ethics required for a manager, what is unethical in your opinion and list few (8M)
      examples of unethical practices of Managers. What kind of ethical behavior do
      you suggest for a public utility organization like Railways?
   b) What is JIT Approach, how can you use JIT concepts in manufacture of TV (8M)
      Picture Tubes?

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5. a) What are the different quantitative models of decision making?   (8M)

   b) Explain importance of ABC Analysis and try to list at least two items of each class   (8M)
       in case of mobile electronics service-dealer with Sony/Nokia/Samsung?

6. a) List and Explain different stages in Product Life Cycle, What is the stage of CRT   (8M)
       Monitors of Computers in comparison to LED monitors.
   b) List and explain various Opportunities & Threats in Mobile Communications   (8M)
       Industry for companies like Airtel, Reliance & Tata with recent spectrum scams
       and reaction of regulatory bodies?

7. a) Enlist ethical qualities that required for Marketing Manager shooting advertising   (8M)
       film for person care & health care products?
   b) What is BPO, how this is an efficient & effective method of service which will   (8M)
       minimize cost & time resources for both manufacturer & consumer.

II B. Tech II Semester Regular Examinations, April/May – 2016
MANAGEMENT SCIENCE
(Electronics and Communications 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) List functions of management and explain role of Organization function along with its sub functions. (4M)
    b) Explain the concept of project management. (4M)
    c) Explain different functions Human Resources Management? How do you evaluate performance of an front line employee of BPO? (4M)
    d) What are the steps involved in Environmental Scanning Process and list internal factors influencing SWOT Analysis? (4M)
    e) Discuss the Ethics of manager. (3M)
    f) Components in Balance Score Card? (3M)

PART –B

2. a) What is control? Explain the concepts of Quality Control Charts. (8M)

    b)

Compute Corresponding Value of Z(x) i.e., probability to complete project within the time, if Time Scheduled is 48 Days.				(8M)
Activity Alternate	Time Optimistic(To) Days	Time Optimistic(To) Days	Time Optimistic(To) Days	
1-2	4	5	12	
2-3	8	10	18	
2-4	6	11	22	
3-5	2	6	10	
4-5	10	15	20	
5-6	7	9	17	

3. a) What are the different functions of Marketing? (8M)
    b) What is a strategy, what are the different types of strategies? What strategies do you suggest for consumer electronics manufacturer, manufacturing Vacuum Cleaners? (8M)

4. a) What are the Ethical practices for a medical profession? List few ethical practices for service sector organizations like hospitals and manufacturer of life saving drugs? (8M)
    b) What is MRP Approach, how can you use MRP concepts for an Automobile Manufacturer(s) like Tata, Maruti & Nissan? (8M)

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5. a) List & explain different methods of deterministic & probabilistic decision making   (8M)
       models?
    b) What are the objectives & Importance of EOQ Approach? How do you decide   (8M)
       EOQ in food processing industry?

6. a) List and Explain different types of marketing channels? What channel do you   (8M)
       prefer in case Voltage Regulators & Capacitors used in Electronics Industry?
    b) Find Strengths & Weaknesses of BSNL in light of global private players in mobile   (8M)
       communication?

7. a) Ethics required for a Producer, Director, Story Writer and Certification Body   (8M)
       Members; for releasing a message oriented movie, as movies are the message
       carriers in any country?
    b) What is Six-Sigma is it really possible and practicable with complex-electronic-   (8M)
       assembly-suppliers to automobile sector. Explain Six-Sigma concept in light of
       recent VOLVO Bus Crashes in India.

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II B. Tech II Semester Regular Examinations, April/May – 2016
MANAGEMENT SCIENCE
(Electronics and Communications 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) What is the importance of Direction Function in Management, what are its sub functions? (4M)
   b) Explain the concept of project management? (4M)
   c) Compare Job Evaluation & Merit Rating in their objectives. (4M)
   d) Differentiate Internal & External Factors influencing Environmental Scanning? (4M)
   e) Identify ethics to be followed by a credit-manager in extending loan to client (3M)
   f) What is Bench Marking, how do you decide bench mark for BPO? (3M)

PART –B

2. a) What is Principles of H. Fayol's Modern Management? Explain any six principles of your choice? Are these principles relevant for today's industry? (8M)
   b) (8M)

Compute Corresponding Value of Z(x) i.e., probability to complete project within the time, if Time Scheduled is 56 Days.			
Activity Alternate	Time Optimistic(To) Days	Time Optimistic(To) Days	Time Optimistic(To) Days
1-2	2	5	14
3-3	6	10	20
2-4	6	8	28
3-4	4	11	18
4-5	8	12	16
5-6	7	13	19

3. a) What are the different methods of production? What is suitable for Iron & Steel Manufacturing Unit like SAIL? (8M)
   b) Explain different types of strategies related to products, markets & functions? How can it be related to Ice-cream Manufacturer? (8M)

4. a) What are the Ethical practices of Mobile-Network provider towards customer, if he involve in manufacture of cell phone and also in communication? (8M)
   b) What is the scope, objectives & concept of Total Quality Management? Can it be employed in Automobile Industry having very large number of Spares & Components & Assemblies? (8M)

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5. a) List & explain different styles & methods of leadership? What leadership style do you expect in Government Sector? (8M)

    b) Determine EOQ if Annual Requirement is 100000 Units, Ordering Cost is Rs.5000/-, Carrying Cost is 25% and Unit Price is Rs.750/-. Also determine Total Cost? (8M)

6. a) What is a Marketing Channel, What factors influencing selection of a marketing channel also explain types of channels? What channel would you prefer for Text Book Publisher and News Paper Publisher? (8M)

    b) List and Explain different components of SWOT Analysis? How SWOT analysis can be conducted in Tourism Sector? (8M)

7. a) What are the principles & objectives of ethics for business and management? How to inculcate & promulgate ethics among business houses? Comment on recent trends in food processing industry? (8M)

    b) What is ERP? What is its objective, scope, functions? What is the state of employing ERP packages in India? Does these packages suitable to SME Sector? (8M)

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II B. Tech II Semester Regular Examinations, April/May – 2016
MANAGEMENT SCIENCE
(Electronics and Communications 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)　Differentiate Planning & Controlling functions of Management?　(4M)
　　b)　What is standard formula used to find out probability of completion of a project if Time Scheduled is Given and Time Estimated is Calculated. Also Compute Time Estimated for an activity if To=10 Days, Tm=12 Days and Tp=20 Days.　(4M)
　　c)　List various methods of Job Evaluation and explain any one method in detail. How to evaluate a Government Job where performance least considered and seniority considered as parameter?　(4M)
　　d)　List different strategic alternatives available for tourism sector.　(4M)
　　e)　Are ethics limited to entrepreneurs/enterprises only? Do Managers & employees also have to follow ethics?　(3M)
　　f)　What is the importance of Supply Chain Management? What supply chain do you consider for poultry products?　(3M)

PART –B

2.　a)　List the Principles of organization? Explain any six principles of your choice?　(8M)
　　b)　Determine Critical Path for following information:　(8M)

Activity	Predecessor	Duration(Days)
A	--	10
B	A	8
C	A	14
D	A	12
E	B	6
F	C	16
G	D	18
H	E,F & G	20

3.　a)　Compare features, merits & demerits of Product & Process Type of Layouts? What layout do you suggest for TV Assembly?　(8M)
　　b)　Different Strategies involved under different stages of Product Life Cycle? What is the stage of Micro Ovens in India?　(8M)

4.　a)　Role of Government, regulatory bodies, professional societies and educational institutions to inculcate ethics among enterprises & promoters of business houses?　(8M)
　　b)　Explain the concept of Business Law and Ethics of management?　(8M)

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5. a) List & explain any two theories of motivation? Do theories work in BPO?   (8M)
    b) What are the determinant of EOQ and compute EOQ if Annual Requirement is   (8M)
       10000 Units, Ordering Cost is Rs.25000/-, Carrying Cost is 20% and Unit Price is
       Rs.500/-.

6. a) What are the different scope & functional areas of management? Explain in detail   (8M)
       functions of financial management? Does Management Functions vary from sector
       to sector and industry to industry?
    b) Draw the flow diagram for Corporate Planning Process and explain various steps   (8M)
       involved? Will it be same for both Manufacturing & IT sector or is there any
       change in the flow diagram? Post your comments?

7. a) What are the different problems & limitations in following ethical principles by   (8M)
       business houses, how to overcome them? Give some examples of
       coaches/managers from Sports?
    b) What is MIS? How MIS is useful for decision making Government R&D   (8M)
       Organization

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II B. Tech II Semester Regular Examinations, April/May - 2016
COMPUTER ORGANIZATION
(Com. to CSE, IT, ECC)

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)	Discuss about floating point representation	(4M)
	b)	Explain about Binary adder-substrator.	(4M)
	c)	What is LIFO? Discuss.	(4M)
	d)	What is BCD subtraction? Discuss.	(3M)
	e)	Define page fault and page replacement?	(4M)
	f)	Differentiate between full duplex and half duplex communication.	(3M)

PART –B

2.	a)	Discuss about the error detection using parity bit code with examples	(8M)
	b)	What is fixed point Representation? Explain with examples.	(8M)
3.	a)	What is instruction format? Discuss about the registers of basic computers.	(8M)
	b)	Discuss about the arithmetic logic shift unit with examples.	(8M)
4.	a)	Give the block diagram for register set in CPU.	(8M)
	b)	What is address sequencing? Discuss.	(8M)
5.	a)	How addition and subtraction is done for decimal numbers? Give the pictorial representation for adding two decimal numbers.	(8M)
	b)	Discuss about Booth's multiplication algorithm	(8M)
6.	a)	Discuss about the virtual memory? Discuss about the mapping of virtual address to memory table.	(8M)
	b)	Discuss about set-associative mapping.	(8M)
7.	a)	Discuss about parallel priority interrupt.	(8M)
	b)	Why does DMA have priority over the CPU When both request a memory transfer?	(8M)

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II B. Tech II Semester Regular Examinations, April/May - 2016
COMPUTER ORGANIZATION
(Com. to CSE, IT, ECC)

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) Discuss about BCD with examples.   (3M)
    b) Differentiate between hardwired control and micro programmed control   (4M)
    c) What is Reverse polish notation? Give examples.   (4M)
    d) What is BCD Adder? Discuss.   (4M)
    e) Discuss about bootstrap loader.   (3M)
    f) What is asynchronous serial transfer? Discuss.   (4M)

PART –B

2. a) Obtain the 9's compliment of the following eight-digit decimal numbers: (4M)
       12349876; 00980100; 90009951 and 00000000
    b) Perform the subtraction with the following unsigned decimal numbers by taking   (12M)
       the 10's complement of the subtrahend
       i)5250-1321   ii) 1753-8640   iii) 20-100   iv) 1200-250

3. a) Explain about shift micro operations with examples.   (8M)
    b) Write a short notes on Arithmetic micro operations.   (8M)

4.   Discuss about different CPU organizations with examples.   (16M)

5. a) Explain how multiplication is done for floating point numbers with flow chart.   (8M)
    b) Discuss about Booth's multiplication algorithm   (8M)

6. a) Define Auxiliary memory? Discuss with neat diagrams.   (8M)
    b) Explain about the procedure for mapping the virtual address in memory table.   (8M)

7. a) What is priority interrupt? Discuss about daisy chaining priority interrupt.   (8M)
    b) What is DMA? Explain with examples.   (8M)

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SET - 3

II B. Tech II Semester Regular Examinations, April/May - 2016
COMPUTER ORGANIZATION
(Com. to CSE, IT, ECC)

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 two's compliment? Give examples	(3M)
	b)	What is Register Transfer? Discuss.	(4M)
	c)	Discuss about RISC instruction.	(4M)
	d)	What is Divide overflow? Discuss.	(3M)
	e)	Discuss about direct mapping.	(4M)
	f)	What is asynchronous data transfer? Discuss.	(4M)

PART –B

2.	a)	Obtain the 10's compliment of the following eight-digit decimal numbers: 123900; 090657; 100000 and 000000	(4M)
	b)	Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend i)11010-10000 ii) 11010-1101 iii) 100-110000 iv) 1010100-1010100	(12M)
3.	a)	Write the function table for arithmetic circuit? Discuss	(8M)
	b)	Design a 4-bit combinational circuit decrementer using 4 full adder circuits.	(8M)
4.		What is addressing modes? Discuss about different addressing modes with examples.	(16M)
5.	a)	Give flow chart for doing decimal division and also explain the sequence of operation of it.	(8M)
	b)	Explain how multiplication is done for floating point numbers with flow chart.	(8M)
6.	a)	What is associate memory? Explain with block diagram.	(8M)
	b)	Discuss about the mapping procedures of cache memory.	(8M)
7.		How the data transfer to and from peripherals is done? Discuss with neat diagrams and examples.	(16M)

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SET - 4

II B. Tech II Semester Regular Examinations, April/May - 2016
COMPUTER ORGANIZATION
(Com. to CSE, IT, ECC)

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 one's compliment? Give examples	(3M)
	b)	Discuss about Three state bus buffers.	(4M)
	c)	What is relative addressing mode? Give example.	(4M)
	d)	Explain Array multifier.	(4M)
	e)	What is address space and memory space? Discuss.	(4M)
	f)	What is interrupted I/O? Discuss.	(3M)

PART –B

2.	a)	Explain the functional units of a CPU.	(8M)
	b)	Explain Hamming code with example.	(8M)
3.	a)	What is Register Transfer language? Discuss about the Register transfer with symbols and examples.	(8M)
	b)	What is Binary Adder? Discuss and also draw the 4-bit Binary adder?	(8M)
4.		How computer instructions are classified? List and explain about them with examples.	(16M)
5.	a)	Discuss about Booth's multiplication algorithm	(8M)
	b)	Explain about the addition and subtraction for the floating point numbers with flow chart.	(8M)
6.	a)	Discuss about Associative mapping with example.	(8M)
	b)	Discuss about the address mapping done by the paging.	(8M)
7.	a)	What is handshaking? Discuss with neat diagrams.	(8M)
	b)	Draw the block diagram for asynchronous communication interface.	(8M)

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R10

SET - 1

II B. Tech II Semester Supplementary Examinations, April/May - 2016
PRODUCTION TECHNOLOGY
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) How are the two halves of a split pattern aligned?
    b) What do you understand by Gating Ratio? How do you design a gating system?

2. a) Describe centrifugal casting process and to what work piece configurations it is best suited?
    b) What are the important considerations in the design of a riser in casting and its placement?

3. a) Explain thermit welding with a neat sketch.
    b) Sketch the various types of welds used in making a joint.

4. a) Explain Laser welding with a neat sketch.
    b) Differentiate between TIG and MIG welding processes.

5. a) How are the properties get changed between hot working and cold working of metals.
    b) Sketch and explain the working of Universal rolling mill and Planetary rolling mill.

6. a) How are presses classified? Explain them briefly.
    b) Explain tube drawing process with a neat sketch.

7. a) Write a short note on drop forging.
    b) Discuss Hydrostatic extrusion with a neat sketch.

8. a) Write the differences between thermosetting materials and thermo plastic materials.
    b) What is Blow Moulding? Explain its applications.

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II B. Tech II Semester Supplementary Examinations, April/May - 2016
ELECTRO MAGNETIC WAVES AND TRANSMISSION LINES
(Com. to ECE, EIE)

Time: 3 hours   Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Explain the following terms: (i) Electric flux density (ii) Coulomb's law (iii) Continuity equation
   b) Point charges 1mC and -2mC are locate at (3,2,-1)and (-1,-1,4)respectively. Calculate the electric force on a 10nC charge located at (0,3,1)and the electric field intensity at that point.

2. a) State Ampere's circuit law? Explain any two applications of Ampere's circuit law.
   b) For a current distribution in free space ,the magnetic vector potential
   $A=(2x^2y+yz) a_x+ (xy^2-xz^3) a_y -(6xyz-2x^2y^2) a_z$ Wb/m .
   Calculate (i) magnetic flux density **B** (ii) Show that div(**A**)=0 and div(**B**)=0.

3. a) Explain the Maxwell's equations in differential forms and word statements for time varying fields.
   b) A parallel plate capacitor with plate area of 5 cm^2 and plate separation of 3 mm has a voltage 50 sin(10^{3}t)Volts applied to its plates. Calculate the Displacement current assuming $\varepsilon=2\varepsilon_0$.

4. a) Explain the relations between E and H in Uniform plane wave .
   b) The magnetic field component of a wave is given by $H = 30 \cos (10^8 t − 6x) \, a_y$ mA/m. Determine (i) the direction of wave propagation (ii) wavelength (iii) wave velocity.

5. a) Derive the expression for reflection coefficient and transmission coefficient for a obliquely incident wave having perpendicular polarization.
   b) Define Brewster angle? A parallel polarized wave propagates from air to dielectric at Brewster angle of 75^0. Find ε_r .

6. a) Explain the different modes of the guided waves.
   b) Describe the cut-off frequency, velocity and wave impedance related to TE wave.

7. a) Define Loading? Explain the different types of transmission lines.
   b) An air line has a characteristic impedance of 70Ω and a phase constant of 3 rad /m at 100 MHz .Calculate the inductance per meter and the capacitance per meter of the line.

8. a) What is meant by smith chart? Explain its significance and applications.
   b) A short=circuited coaxial transmission line has Z$_0$=60Ω and γ=j8.5/m .Calculate the input impedance if the length of the line is 15cm and λ/8.

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II B. Tech II Semester Supplementary Examinations, April/May - 2016
FLUID MECHANICS AND HYDRALICS MACHINES
(Auto Mobile Engineering)

Time: 3 hours   Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Describe with a neat sketch how the difference of pressure at two points of a pipe can be measured with the help of a differential manometer and derive the required equation.
   b) Draw a neat sketch of inverted U-tube differential manometer. Under what pressure conditions it can be used?

2. a) Explain the following terms in brief:
   i) Stream function ii) Velocity potential function iii) Circulation iv) Flow net.
   b) Check whether the following sets of velocity components satisfy the continuity equation of incompressible flow: i) $u = x + y$, $v = x - y$ ii) $u = 3xy$, $v = x^3 - xy^3$
   iii) $u = 2x^2 - x y + z^2$, $v = x^2 - 4xy + y^2$, $w = 2xy - y z + y^2$.

3. An inclined venturimeter is used to measure the flow of water in a pipe of diameter 15 cm. A differential mercury manometer is connected to the inlet and throat. The maximum range available in differential mercury manometer is 30 cm of mercury deflection. Find the maximum throat diameter which will induce full gauge deflection when the flow rate is 0.026m³/ s. Coefficient of discharge for the venturimeter is 0.98.

4. A jet of water 80 mm diameter impinges on a curved vane which is moving in the same direction as that of jet with a velocity of 8 m/s. The jet leaves the vane at an angle of 60° with the direction of motion of vane. The rate of flow of the water is 80 litres/s. Find neglecting friction (a) the force exerted by the jet in the direction of motion of the vane and (b) the work done by the jet per second.

5. a) What are the different types of hydropower plants ? Describe each one briefly.
   b) Write a brief note on the relative economics of a hydel plant and a thermal plant for power generation.

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6. A Francis turbine has to be designed to develop 370 k W under a head of 70 m while running at speed equal to 750 rpm

   Ratio of width of runner to the outer diameter of runner = 0.1

   Ratio of inner diameter to the outer diameter = 0.5

   Flow ratio =0.15

   Hydraulic efficiency = 95%

   Mechanical efficiency = 84%

   Circumferential area occupied by thickness of vanes = 5%

   Assuming velocity of flow constant, calculate guide vane angle at inlet and runner vane angles at inlet and outlet. The radial velocity is equal to 3.5 m/sec.

7. a) What are unit quantities? Define the unit quantities for a turbine.

   b) A turbine with an overall efficiency of 85% is to be installed in a hydroelectric plant. The head and discharge available at the plant are 25 m and 45 m³/sec respectively. If the specific speed of the turbine is 230, determine the unit speed, unit discharge and unit power.

8. a) Describe what do you mean by pumps in series and pumps in parallel as in case of centrifugal pumps? What advantage do we get from the above two arrangement?

   b) A single –acting reciprocating pump operating at 60 rpm has a piston diameter of 20 cm and stroke length of 30 cm. The suction pipe is 10 cm in diameter and 7 m long. If the separation takes place at 2.5 m of water absolute, determine the maximum permissible value of suction lift. Take atmospheric pressure head as 10.3 m of water.

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II B. Tech II Semester Supplementary Examinations, April/May - 2016
ELECTRO MAGNETIC WAVES AND TRANSMISSION LINES
(Com. to ECE, EIE)

Time: 3 hours   Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Explain the following terms: (i) Electric flux density (ii) Coulomb's law (iii) Continuity
       equation
    b) Point charges 1mC and -2mC are locate at (3,2,-1)and (-1,-1,4)respectively. Calculate the
       electric force on a 10nC charge located at (0,3,1)and the electric field intensity at that
       point.

2. a) State Ampere's circuit law? Explain any two applications of Ampere's circuit law.
    b) For a current distribution in free space ,the magnetic vector potential
       $A=(2x^2y+yz)$ $a_x+ (xy^2-xz^3)$ a_y -$(6xyz-2x^2y^2)$ a_z Wb/m .
       Calculate (i) magnetic flux density **B** (ii) Show that div(**A**)=0 and div(**B**)=0.

3. a) Explain the Maxwell's equations in differential forms and word statements for time
       varying fields.
    b) A parallel plate capacitor with plate area of 5 cm^2 and plate separation of 3 mm has
       a voltage 50 sin(10^{3}t)Volts applied to its plates. Calculate the Displacement current
       assuming ε=2ε$_0$.

4. a) Explain the relations between E and H in Uniform plane wave .
    b) The magnetic field component of a wave is given by $H = 30 \cos (10^8t - 6x)$ a_y mA/m.
       Determine (i) the direction of wave propagation (ii) wavelength (iii) wave velocity.

5. a) Derive the expression for reflection coefficient and transmission coefficient for a
       obliquely incident wave having perpendicular polarization.
    b) Define Brewster angle? A parallel polarized wave propagates from air to dielectric at
       Brewster angle of 75^0. Find ε$_r$.

6. a) Explain the different modes of the guided waves.
    b) Describe the cut-off frequency, velocity and wave impedance related to TE wave.

7. a) Define Loading? Explain the different types of transmission lines.
    b) An air line has a characteristic impedance of 70Ω and a phase constant of 3 rad /m at
       100 MHz .Calculate the inductance per meter and the capacitance per meter of the line.

8. a) What is meant by smith chart? Explain its significance and applications.
    b) A short=circuited coaxial transmission line has Z$_0$=60Ω and γ=j8.5/m .Calculate the input
       impedance if the length of the line is 15cm and λ/8.
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