

Code No: RT32015

R10

Set No. 1

III B. Tech II Semester Supplementary Examinations, November/December – 2016

TRANSPORTATION ENGINEERING – II

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

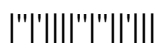
Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

PART-A

1. a) List the types of rail joints. [4M]
- b) What are the objectives of providing super elevation on railway tracks. [4M]
- c) List the systems of controlling the movement of train. [3M]
- d) List the various visual aids in airports. [3M]
- e) What are time of concentration and time of flow, with reference to airport drainage? [4M]
- f) How are ports classified into? [4M]

PART-B

2. a) Write the functions of sleepers? [8M]
- b) Find the number of sleepers required for constructing a B.G. railway track 640m long, using a sleeper density of $M+5$, where M is the length of the rail in metres. [8M]
3. a) What is the need for providing transition curves on railways? Explain how the length of transition curve is decided. [8M]
- b) Explain the necessity of widening of gauge on curves. [8M]
4. a) Write short notes on Warner signal, Shunting signal, Disc signal and routing signal. [8M]
- b) Explain the working principle of centralized traffic control system and automatic train control system. [8M]
5. a) Write notes on corrections for elevation and temperature for a runway? [8M]
- b) Explain about the factors to be considered for selecting a site for an airport? [8M]
6. a) How is the maintenance and rehabilitation carried out for airfield pavements? [8M]
- b) Write the procedure to evaluate an airfield pavement and steps taken to strengthen it? [8M]
7. a) Differentiate between wharf, jetty and quay? [8M]
- b) List the navigational aids and explain their importance? [8M]



III B. Tech II Semester Supplementary Examinations, November/December - 2016
MANAGEMENT SCIENCE
(Common to EEE & CHEM.)

Time: 3 hours

Max. Marks: 70

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

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**PART -A**

- 1 a) Define the concept of Management. [4M]  
 b) Explain the concept of Work Study. [3M]  
 c) Define the concept of Merit Rating. [4M]  
 d) Explain the concept of PERT. [4M]  
 e) Describe the elements of Corporate Planning Process. [3M]  
 f) Define the concept of Just – In – Time. [4M]

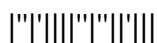
**PART -B**

- 2 a) Describe the importance of Management. [6M]  
 b) Explain any two theories of Motivation. [4M]  
 c) Describe the decision making process. [6M]
- 3 a) Define the principles of Management. [5M]  
 b) Explain various control charts. [6M]  
 c) Describe ABC analysis. [5M]
- 4 a) Explain the functions of a HR manager. [8M]  
 b) Describe the stages in Product Life Cycle. [8M]
- 5 a) Explain the concept of developing a network. [6M]  
 b) The following are the activities and the time duration pertaining to assembly and testing of a heat exchanger. [10M]

| Activity | Activity description    | Time duration (weeks) |
|----------|-------------------------|-----------------------|
| 1-2      | Remove internals        | 2                     |
| 1-4      | Install external wiring | 3                     |
| 2-4      | Install internal wiring | 2                     |
| 3-4      | Install thermocouples   | 4                     |
| 2-3      | Construct supports      | 3                     |
| 2-5      | Install heaters         | 2                     |
| 3-5      | Install new tubes       | 4                     |
| 5-6      | Leak test               | 2                     |
| 4-6      | Check and calibrate     | 2                     |
| 6-7      | Insulate                | 1                     |
| 7-8      | Test at temperature     | 1                     |

- 6 a) Describe the SWOT analysis. [8M]  
 b) Describe the steps in strategy formulation and implementation. [8M]
- 7 a) Describe the concept of Business Process Outsourcing. [8M]  
 b) Explain Business process Re-engineering and Bench Marking. [8M]

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## III B. Tech II Semester Supplementary Examinations, November/December - 2016

HEAT TRANSFER  
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**  
**(Heat transfer data book allowed)**

**PART -A**

- 1 a) Calculate the rate of heat transfer per unit area through a copper plate 45 mm thick, whose one face is maintained at  $350^{\circ}\text{C}$  and the other face at  $50^{\circ}\text{C}$ . Take thermal conductivity of copper as  $370\text{ W/m}^{\circ}\text{C}$ . [3M]
- b) Calculate the amount of energy required to solder together two very long pieces of bare copper wire 1.5 mm diameter with solder that melts at  $190^{\circ}\text{C}$ . The wires are positioned vertically in air at  $20^{\circ}\text{C}$ . Assume that the heat transfer coefficient on the wire surface is  $20\text{ W/m}^{\circ}\text{C}$  and thermal conductivity of wire alloy is  $330\text{ W/m}^{\circ}\text{C}$  [4M]
- c) Discuss the physical significance of Stanton number and Grashoff number [4M]
- d) Write the momentum equation for hydrodynamic boundary layer over a flat plate. Explain the physical meaning of each term contained in it. [4M]
- e) Describe about film wise condensation. [3M]
- f) Define the terms absorptivity, reflectivity and transmittivity of radiation. [4M]

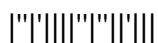
**PART -B**

- 2 a) A standard cast iron pipe (inner diameter = 50 mm and outer diameter = 55 mm) is insulated with 85 percent magnesium insulation ( $k = 0.02\text{ W/m}^{\circ}\text{C}$ ). Temperature at the interface between the pipe and insulation is  $300^{\circ}\text{C}$ . The allowable heat loss through the pipe is  $600\text{ W/m}$  length of pipe and for the safety, the temperature of the outside surface of insulation must not exceed  $100^{\circ}\text{C}$ . Determine i) Minimum thickness of insulation and ii) the temperature inside surface of the pipe assuming its thermal conductivity as  $20\text{ W/m}^{\circ}\text{C}$ . [10M]
- b) Derive the expression for temperature distribution associated with radial conduction through a sphere. [6M]
- 3 a) A turbine blade made of stainless steel ( $k = 29\text{ W/m}^{\circ}\text{C}$ ) is 60 mm long,  $500\text{ mm}^2$  cross-sectional area and 120 mm perimeter. The temperature of the root of blade is  $480^{\circ}\text{C}$  and is exposed to products of combustion passing through the turbine at  $820^{\circ}\text{C}$ . If the film coefficient between the blade and the combustion gases is  $320\text{ W/m}^2\text{C}$ , determine i) the temperature at the middle of the blade; ii) the rate of heat flow from the blade. [12M]
- b) Explain the significance of Heisler charts in solving transient conduction problems. [4M]



- 4 Using Buckingham  $\pi$  dimensional analysis, derive an expression for heat transfer coefficient for a free convection. The variables involved are  $h$ (heat transfer coefficient),  $\rho$ (fluid density),  $D$ (tube diameter),  $\mu$ (fluid viscosity),  $c_p$ (specific heat),  $k$  (thermal conductivity),  $\beta g \Delta t$  ( $\beta$  - coefficient of volume expansion of the fluid,  $\Delta t$  - difference of temperatures between the heated surface and the undisturbed fluid). [16M]
- 5 A vertical cylinder 1.5 m high and 180 mm in diameter is maintained at  $100^\circ\text{C}$  in an atmospheric environment of  $20^\circ\text{C}$ . Calculate heat loss by free convection from the surface of the cylinder. Assume properties of air at mean temperature as  $\rho = 1.06\text{ kg/m}^3$ ,  $\nu = 18.97 \times 10^{-6}\text{ m}^2/\text{s}$ ,  $c_p = 1.004\text{ kJ/kg}^\circ\text{C}$  and  $k = 0.0142\text{ kJ/mh}^\circ\text{C}$ . [16M]
- 6 a) Derive an expression for logarithmic mean temperature difference (LMTD) in case of counter flow heat exchanger. [10M]  
b) A vertical plate 2.8 m high is maintained at  $54^\circ\text{C}$  in the presence of saturated steam at atmospheric pressure. Calculate the heat transfer per unit width. [6M]
- 7 Two parallel black plates  $0.5 \times 1.0\text{m}$  is spaced  $0.5\text{m}$  apart. One plate is maintained at  $1000^\circ\text{C}$  and the other at  $500^\circ\text{C}$ . What is the net radiant heat exchange between the two plates? [16M]

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**III B. Tech II Semester Supplementary Examinations, November/December - 2016**  
**WEB TECHNOLOGIES**  
 (Common to CSE and 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. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

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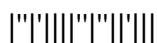
**PART -A**

- |   |                                                        |      |
|---|--------------------------------------------------------|------|
| 1 | a) Write the structure of HTML Program.                | [3M] |
|   | b) What are the different XSLT elements?               | [4M] |
|   | c) What is synchronous request in AJAX?                | [4M] |
|   | d) What is the difference between include and require? | [4M] |
|   | e) What are scalar data and scalar variables?          | [4M] |
|   | f) What is a Ruby script?                              | [3M] |

**PART -B**

- |   |                                                                                                                                     |      |
|---|-------------------------------------------------------------------------------------------------------------------------------------|------|
| 2 | a) With the neat block diagram explain the CSS Box Model.                                                                           | [8M] |
|   | b) Write a Java Script code to generate the current date in words format "Day, Month Date, Year". (Hint: Friday, December 18, 2015) | [8M] |
| 3 | a) Create a XML document to store voter ID, voter name, address and date of birth details. Create a DTD to validate the document.   | [8M] |
|   | b) What is DOM? Draw the detailed DOM objects structure. Explain its usage.                                                         | [8M] |
| 4 | a) Discuss in detail Integrating PHP and AJAX.                                                                                      | [8M] |
|   | b) What is UDDI? Explain in detail the architecture of UDDI.                                                                        | [8M] |
| 5 | a) How we can retrieve the data in the result set of MySQL using PHP? Explain.                                                      | [8M] |
|   | b) What is the difference between explode () and split () functions in PHP? Explain with an example.                                | [8M] |
| 6 | a) Explain with an example how to open and read data files with Perl.                                                               | [8M] |
|   | b) Write a short note on Perl language elements.                                                                                    | [8M] |
| 7 | a) Write a ruby script to display grades of a student using hashes.                                                                 | [8M] |
|   | b) Explain in detail Practical Web Applications.                                                                                    | [8M] |

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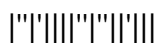


**III B.Tech II Semester Supplementary Examinations, November/December - 2016****POWER SEMICONDUCTOR DRIVES****(Electrical and Electronics Engineering)****Time : 3 hours****Max. Marks: 75****Answer any Five Questions  
All Questions carry equal marks**

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- 1 Explain speed control of induction motor by [15M]  
a) stator voltage Control b) stator frequency Control c) rotor resistance Control  
d) rotor e.m.f. injection Control.
- 2 a) Explain the use of freewheeling diode in the converter fed dc drives. Take an example [8M]  
of 1-phase fully controlled converter for explanation. How it is going to affect the  
machine performance.  
b) A 220 Volts, 960rpm, 13 Amps separately excited d.c. motor has armature resistance of [7M]  
2 ohms. It is fed from a single-phase half controlled rectifier with an a.c.source of 230  
volts, 50HZ. Assuming continuous conduction, calculate motor torque for  $\alpha = 60^\circ$  and  
speed 600 rpm.
- 3 A 220V, 1450rpm , 60A separately excited motor with armature resistance of 0.4  $\Omega$  is [15M]  
fed form a 3-phase fully controlled rectifier. Available ac source has a line voltage of  
440V,50Hz . A star delta connected transformer is used to feed the armature so that  
motor terminal voltage equals rated voltage when converter firing is zero  
(i) calculate the transformer turns ratio (ii) determine the value of firing angle when  
(a) Motor is running at 1100 rpm and rated torque  
(b) When motor is running at -750 rpm and twice the rated torque.
- 4 Explain briefly the following methods of braking a DC motor. [15M]  
(a) Regenerative braking (b) Dynamic braking (c) Plugging.
- 5 A dc chopper controls the speed of dc series motor. The armature resistance [15M]  
 $R_a = 0.05\Omega$ , field circuit resistance  $R_f = 0.055\Omega$ , and back emf constant  
 $K_v = 35 \text{ mV/rad/s}$ . The dc input voltage of the chopper  $V_s=600\text{v}$ . If it is required to  
maintain a constant developed torque of  $T_d = 547\text{N-m}$ , plot the motor speed against the  
duty cycle K of the chopper.
- 6 a) Explain volts/hertz control for a three phase induction motor for its speed control and [8M]  
write its advantages.  
b) Draw a closed loop block schematic diagram for the speed control of induction motor [7M]  
by VSI controllers. Mention the merits of this method of speed control.
- 7 A Three phase, 400v, 6-pole, 50hz delta connected slip ring induction motor has rotor [15M]  
resistance of 0.25 $\Omega$  and leakage reactance of 12 $\Omega$  per phase referred to stator . When  
driving a fan load it runs at full load at 3% slip. What resistance must be inserted in the  
rotor circuit to obtain a speed of 850 rpm .neglect stator impedance and magnetizing  
branch? Stator to rotor turns ratio is 2.2.
- 8 a) Explain Principle and operation of self control of synchronous motor by Voltage [8M]  
source inverter.  
b) Explain variable frequency speed control of synchronous motor. [7M]

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Code No: **R32035**

**R10**

**Set No. 1**

**III B.Tech II Semester Supplementary Examinations, November/ December – 2016**

**DESIGN OF MACHINE MEMBERS-II**

**(Mechanical Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions**  
**All Questions carry equal marks**  
**(Data books may be allowed)**

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- 1 a) Enumerate the important physical characteristics of a good bearing material.  
b) A ball bearing is required to resist a radial load of 10 kN and a thrust load of 5 kN. The average life of the bearing is to be 5000 hours, with inner race rotation at 980 rpm. What basic dynamic load rating must be used in selecting the bearing? If this bearing is to have a life of 5000 hours at a reliability of 97% what is the required basic dynamic load rating?
- 2 a) State the various forces which affect the design of the connecting rod, and explain their influence choosing the suitable materials for various parts and adopting suitable stress values  
b) At what angle of the crank, the twisting moment is maximum and minimum in the crankshaft?
- 3 Determine the thickness of head of a Cast Iron piston for a single acting 4-stroke engine for the following specification.  
Cylinder bore = 100 mm; Maximum gas pressure = 5 MPa  
Stroke = 120 mm; Fuel consumption = 0.227 Kg/BP  
BMEP ( $P_m$ ) = 0.65 N/mm<sup>2</sup> ; Speed = 2200 rpm  
Calorific value = 41870 KJ/Kg
- 4 The section of a crane hook is rectangular in shape whose width is 30 mm and depth is 60 mm. The centre of curvature of the section is at a distance of 125 mm from the inside section and the load line is 100 mm from the same point. Find the capacity of the hook if the allowable stress in tension is 75 MPa. Find the position of the Neutral axis and draw a diagram to show the variation of stress across the section.
- 5 a) Give a brief account of belt materials.  
b) A V-belt drive system transmits 100 kW at 500 rpm. The belt has a mass of 0.6 kg/m. The maximum permissible tension in the belt is 900 N. The groove angle is 38° and the angle of contact is 160°. Find minimum number of belts and pulley diameter. The coefficient of friction between belt and pulley is 0.2
- 6 Design a spur gear drive to transmit 150 kW from a motor shaft running at 770 rpm to a machine spindle running at 140 rpm. The service is intermittent with light shock loads.



Code No: **R32035**

**R10**

**Set No. 1**

- 7 a) Distinguish between square and the Acme threads.
- b) A square threaded screw is required to work against an axial force of 6 kN and has dimensions, Major diameter  $d = 32$  mm; pitch  $p = 4$  mm with single start, coefficient of friction = 0.08. Calculate torque required when screw moves against the load and the Efficiency of the screw.
- 8 a) Why a boss is generally needed at the fulcrum of the levers?
- b) The hand lever of 1 m is mounted on a shaft. The effort applied by the operator at the end of a lever is 200 N. determine the section of the lever near the boss if the permissible flexural stress is limited to 80 MPa. Assume that the section of the lever is rectangular having thickness equal to two fifth of the depth.





Code No: **R32045**

**R10**

**Set No. 1**

**III B.Tech II Semester Supplementary Examinations November/December - 2016**

**VLSI DESIGN**

**(Common to ECE, ECM and EIE)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions  
All Questions carry equal marks**

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- 1 a) What are ic fabrication steps. [8M]  
b) With neat sketches explain the nmos fabrication procedure [7M]
- 2 What are mos transistor parameters? determine each parameter individually [15M]
- 3 a) What are design rules? Why is metal-metal spacing larger than poly-poly spacing? [8M]  
b) Discuss the transistor related design style (orbit 2 $\mu$ m CMOS)? [7M]
- 4 a) Draw the model for deviation of the time delay and explain it. [8M]  
b) What do you mean by inverter delay? [7M]
- 5 a) Discuss the limits due to sub threshold currents? [7M]  
b) Write briefly on switch logic and gate logic [8M]
- 6 a) Compare PAL, PLA, CPLD, FPGA? [10M]  
b) Draw and explain the antifuse structure for programming the PAL device. [5M]
- 7 a) What is the use of subprograms? [7M]  
b) What are the levels of abstraction? [8M]
- 8 a) What are the features of vhdl? [7M]  
b) What are the different types of modeling in vhdl? [8M]

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