Code : 1G644

R-11/R-13

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Building Planning and Drawing
(Civil Engineering)

Max. Marks: 70   **Time: 03 Hours**

PART-A
(Answer any **THREE** questions 3 X 14= 42 Marks)

1.   Write a short notes on the following : detached house, setback, building line , floor area ratio

2. a) Explain how you will select a site for the construction of a residential building.

   b) Explain the characteristics of the directions briefly

3.   List out and detail the facilities to be provided in the layout of a bank

4.   What are the stages of a construction project and construction management team explain by using flow charts?

5. a) Differentiate clearly between PERT and CPM network methods

   b) What are the features of network planning? Why do we use network planning? Explain in detail

PART-B
(Answer any **ONE** question on drawing sheet 1 x 28 = 28 Marks)

6. a) Draw the conventional signs of

   (**i**) Ventilator.   (**ii**) Timber.   (**iii**) Ground level.   (**iv**) Wash basin.

   b) Draw the front elevation and sectional plan of a half glazed paneled door with swing ventilator to fit in an opening of 1200 mmx2100 mm and label the parts

7.   Draw the plan section and elevation of hotel building with the help of the data given below to a scale of 1:50.

   i. Entrance foyer-1.

   ii. Reception room-1.

   iii. Public rooms-1.

   iv. Bed rooms with bath cum W.C-14.

   v. Kitchen-1.

   vi. Sanitary units-1.

   vii. Laundary-1.

   viii. Store room-1.

   ix. Open to sky

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Environmental Science
(Common to CE, ME and CSE)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1.	a)	Define environment? Explain the branches of Environmental education.	7M
	b)	What is a Biosphere? Discuss its significance.	7M
2.		Write a brief note on.	
	a)	a) Floods.	7M
	b)	b) Use of alternate energy resources.	7M
3.	a)	What are the environmental hazards associated with mineral extraction.	7M
	b)	Discuss, we live in a world where in natural resources are limited?	7M
4.	a)	Discuss the effects and control measures of marine pollution.	7M
	b)	Write a brief account of solid waste management.	7M
5.		Discuss the structure and functions of forest ecosystem.	14M
6.	a)	List the main biogeographic zones in India.	8M
	b)	What is biodiversity? Write a note on poaching of wild life.	6M
7.	a)	What are the causes effects and control measures of Global warming?	8M
	b)	Write a short note on waste land reclamation.	6M
8.	a)	Explain the necessity of value education.	7M
	b)	What is the role of information technology (IT) in environment and human health?	7M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Hydraulics and Hydraulic Machinery
(Civil Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any **five*** questions
All Questions carry equal marks (14 Marks each)
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1. a) Define physically and mathematically the concept of displacement, momentum and energy thickness of boundary layer.   7M

   b) Discuss the phenomenon of separation in a diverging flow.   7M

2. a) Show that at critical depth for minimum specific energy $\dfrac{Q^2}{g} = \dfrac{Ac^3}{T}$ 7M

   b) A rectangular channel 3M wide carries a flow of 54m³/sec. Find the critical depth and critical velocity for this flow?   7M

3. a) Classify the hydraulic jump on the basis of Fronde's number.   7M

   b) Water is a 10M wide rectangular channel experiences a jump in depth from 2M to 6M. Find the Fronde's numbers on either side of jump.   7M

4. A jet of water strikes a symmetrically curved concave vane and gets deflected through 120° when stationary. If the water jet is moving at 15m/sec. and the vane is moving at 6m/sec. Find the angle of the jet at inlet and outlet. Also find the absolute velocity of the jet at outlet in magnitude and direction and work done on the vane per second. What is the hydraulic efficiency of a system? Take diameter of the jet as 80mm.   14M

5. a) Differentiate between (**i**) axial flow and radial flow turbines
   (**ii**) inward and outward flow turbines (**iii**) Kaplan and Propeller turbine.   7M

   b) Design a pelton wheel turbine to meet the following particulars. Overall efficiency 85%, coefficient of velocity 0.98, speed ratio 0.45, shaft power 500kW, speed 200rpm, Net Head 100M.   7M

6. A 1:10 scale model was made for testing a turbine which develops 1MW while running at 120 rpm under a net head of 12M. The overall efficiency at the best operating point is 90%. The model is tested under a head of 4M. Find out the discharge speed and power output of the model. If it runs under the conditions similar to the prototype. Also find the specific speed of the turbines.   14M

7. a) What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of a centrifugal pump?   7M

   b) How will you obtain expression for minimum speed for starting a centrifugal pump   7M

8. a) How do we make a choice of location of hydro plant?   7M

   b) Discuss methods of estimating long term and short term demands.   7M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Mathematics – III
(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *any* **five** questions
All Questions carry equal Marks (**14 Marks** each)
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1. a) Evaluate $\int_{0}^{\pi/2} \sqrt{\tan\theta}\, d\theta$.   7M

   b) Prove that $\beta(m, 1/2) = 2^{2m-1}\beta(m,m)$.   7M

2. a) Prove that the function f(z) defined by

   $$f(z) = \frac{x^3(1+i) - y^3(1-i)}{x^2 + y^2} \quad (z \neq 0),\ f(0) = 0$$

   is continous and the Cauchy's Riemann equations are satisfied at the
   at the origin,   yet $f'(0)$ does not exist   7M

   Find the analytic function whose real part is $\sin 2x$

   b) Find the analytic function, whose real part is $\dfrac{\sin 2x}{(\cosh 2y - \cos 2x)}$ 7M

3. a) If cosh(u+iv)=x+iy then prove that

   $$\frac{x^2}{\cosh^2 u} + \frac{y^2}{\sinh^2 u} = 1 \quad and \quad \frac{x^2}{\cos^2 v} - \frac{y^2}{\sin^2 v} = 1.$$ 7M

   b) Find all the roots of the equation tanhz+2=0.   7M

4. a) State and prove Cauchy's integral formula.   7M

   b) Evaluate $\int_{c} \dfrac{\sin^2 z}{(z - \pi/6)^3}\, dz$ where c is the circle |z|=1.   7M

5. a) Find the Taylor's expansion of $f(z) = \dfrac{1}{(z+1)^2}$ about the point z=-i.   7M

   b) Expand $f(z) = \dfrac{1}{(z-1)(z-2)}$ in the regions (i) $|z| < 1$,(ii) $1 < |z| < 2$.   7M

6. a) Using Residue theorem, evaluate $\int_{c} \tan z\, dz$ where c is the circle $|z| = 2$.   7M

   b) By Integrating around a unit circle, evaluate $\int_{0}^{2\pi} \dfrac{\cos 3\theta}{5 - 4\cos\theta}\, d\theta$.   7M

7. a) State and prove Rouche's theorem.   7M

   b) Prove that the polynomial $z^5 + z^3 + 2z + 3$ has just one zero in the first quadrant of the complex plane.   7M

8. a) Find the image of the infinite strip $0 < y < \dfrac{1}{2}$ under the transformation

   $$w = \frac{1}{z}.$$ 7M

   b) Find the Bilinear transformation which maps the points (,i,0) in the z-plane into (-1,-i,1) in the w-plane.   7M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
STRUCTURAL ANALYSIS-I
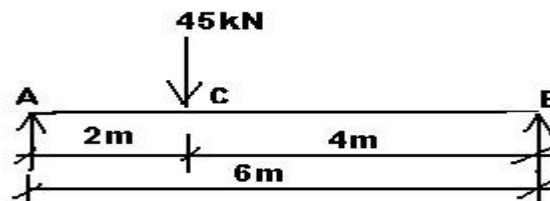*(Civil Engineering)*

Max. Marks: 70   **Time: 03 Hours**

Answer *any* **five** questions
All Questions carry equal marks (14 Marks each)
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1   A beam AB is simply supported over a span 6m in length. A concentrated load of 45kN is acting at a section 2m from support. Calculate the deflection under the load point. Take E = 200 x 10^6 kN/m^2. And I = 13 x 10^{-6} m^4

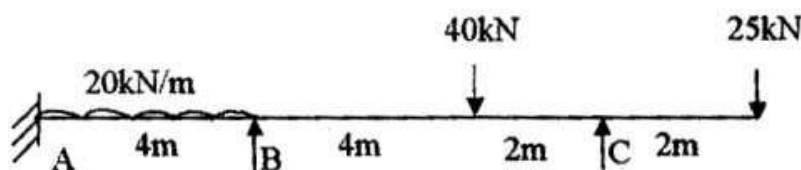   14M

2.   Draw the bending moment diagram and shear force diagram for the continuous beam shown in figure below using theorem of three moments method. EI is constant.
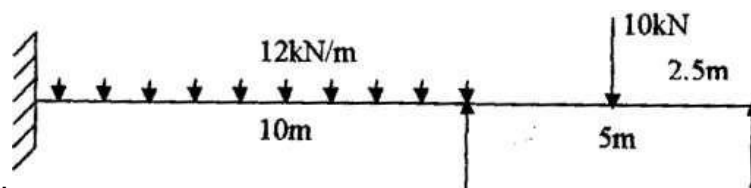
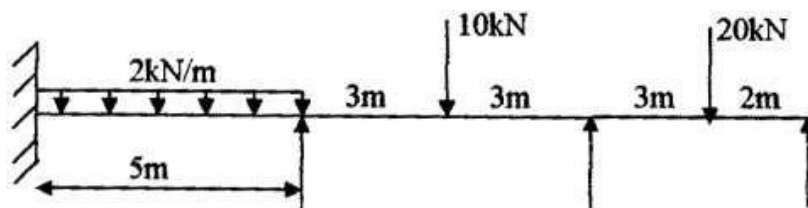   14M

3.   Using slope deflection method, determine slope at B and C for the beam shown in figure below. EI is constant. Draw free body diagram of BC.

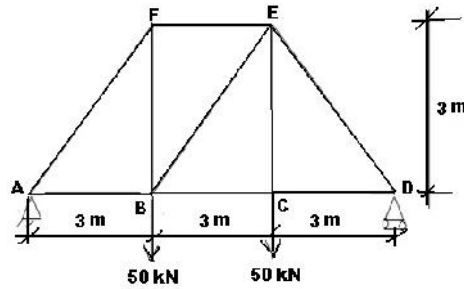   14M

4.   Draw the bending moment diagram and shear force diagram for the continuous beam shown in figure below using moment distribution method. EI is constant.

                                                                                    14M

5. Determine the vertical displacement of joint C of the steel truss shown in figure below. The cross sectional area of each member is A = 400mm^2 and E = 200 GPa.

14M

6. Two concentrated rolling loads of 12 kN and 6 kN placed 4.5 m apart, travel along a freely supported girder of 16m span. Draw the diagrams for maximum positive shear force, maximum negative shear force and maximum bending moment.

14M

7. Derive the influence diagram for reactions and bending moment at any section of a simply supported beam. Using the ILD, determine the support reactions and find bending moment at 2m, 4m and 6m for a simply supported beam of span 8m subjected to three point loads of 10kN, 15kN and 5kN placed at 1m, 4.5m and 6.5m respectively.

14M

8.   a) Differentiate the perfect frame from deficient frame with an example?
     b) Differentiate: determinate and indeterminate structures?
     c) Define degree of freedom and what do you understand by internal hinge in the structure

14M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016
Strength of Materials-II
(Civil Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any* **five** questions
All Questions carry equal marks (14 Marks each)
****

1. Derive an expression for change in dimensions of a thin cylindrical shell due to internal pressure.   14M

2. A steel plug 120mm in diameter is forced into a steel ring of 180mm external diameter and 75mm wide. The strain in the circumferential direction was measured as 0.700×10^{-4}. If µ between the contact surfaces is 0.3 and E= 200 GN/m^2, calculate the axial force required to push the plug out of the ring.   14M

3. a) What are the assumptions made in the theory of pure torsion?   7M
    b) Derive the basic torsion equation $T/J = fs/R = c^\theta/l$.   7M

4. A weight of 200N is dropped on to a helical spring made of 15 mm wire, closely coiled to a mean diameter of 150mm with 22 coils. Determine the height of drop if the instantaneous compression is 68mm. C= 84 GN/m^2.   14M

5. Compare the crippling loads given by Rankine's and Euler's formulae for a tabular strut 3m long with outer and inner diameters of 40mm & 35mm loaded through pin joints at both ends. Take yield stress as 350 MN/m^2, = 1/7500 & E= 200 GN/m^2.   14M

6. A hollow circular cast iron column of 25cm external diameter and 2cm thickness carries a load of 100 KN in the vertical plane at an eccentricity of 8cm. Determine the maximum and minimum stresses developed in the material.   14M

7. a) Explain the term unsymmetrical bending.   5M
    b) A beam of rectangular section 100mm wide and 120mm deep is subjected to a maximum BM of 16KNm. Locate the nutral axis of the section & calculate the maximum bending stress induced in the section.   9M

8. A ring beam of circular shape has a radius of 4m and is supported on 8 equally spaced supports. The beam carries a udl of 3.6 KN/m inclusive of its own self weight. Determine the bending moment & shear force at salient points & plot their variation.   14M

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