



Subject Code: R16CE2101

II B.Tech I Semester Regular Examinations, Nov-2017.

PROBABILITY AND STATISTICS

(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) State Additive and Multiplicative theorems for two events.
- (b) Define Gamma distribution.
- (c) How many different samples of size $n = 2$ can be chosen from a finite population of size $N = 25$.
- (d) State Null hypothesis and Level of Significance.
- (e) Explain the Principle of Least Square method.
- (f) Write the formula for 3-sigma control limits for P-charts.

[2+2+2+2+2+2]

PART-B

2. A Random Variable X has the following probability distribution.

[12]

x	0	1	2	3	4	5	6	7	8
P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a

- (i) Determine the value of 'a'.
 - (ii) Find $P(x < 3)$, $P(x \geq 3)$ and $P(0 < x < 5)$
 - (iii) Find the Distribution function $F(x)$
3. (a). Define Mean and Variance of Gamma Distribution [3 + 9]
- (b) If a random variable has the standard normal distribution, find the probability that it will take on a value ($\mu = 0, \sigma = 1$) (i) less than 1.50 (ii) less than -1.20 (iii) greater than 2.16 (iv) greater than -1.75.
4. A population consists of 5, 10, 14, 18, 13, 24. Consider all possible samples of size two which can be drawn without replacement from the population. Find
- (a) The mean of the population
 - (b) The standard deviation of population
 - (c) The Mean of the sampling distribution of means
 - (d) The standard deviation of sampling distribution of means. [2+2+ 4+4]

5. A company claims that its light bulbs are superior to those of its main competitor. If a study showed that a sample of $n_1 = 40$ of its bulbs has a mean lifetime of 647 hours of continuous use with a standard deviation of 27 hours, while a sample of $n_2 = 40$ bulbs made by its main competitor has a mean lifetime of 638 hours of continuous use with a standard deviation of 31 hours, does this substantiate the claim at the 0.05 level of significance? [12]

6. The following are the numbers of minutes it took 10 mechanics to assemble a piece of machinery in the morning x and in the late afternoon y :

[12]

$x :$	11.1	10.3	12.0	15.1	13.7	18.5	17.3	14.2	14.8	15.3
$y :$	10.9	14.2	13.8	21.5	13.2	21.1	16.4	19.3	17.4	19.0

Calculate rank correlation which deals with the time it takes mechanics to assemble a certain piece of machinery in the morning and in the late afternoon.

7. The specifications require that the weight of casting have $\mu = 4.1$ ounces and $\sigma = 0.05$ ounces.

[12]

- Use the specifications to calculate a central line and three-sigma control limits for an \bar{x} chart with $n = 5$.
- Use the specifications to calculate a central line and three-sigma control limits for an R chart with $n = 5$.

Sample	1	2	3	4	5	6	7	8	9	10	11	12	13
\bar{x}	4.24	4.18	4.26	4.21	4.22	4.18	4.23	4.19	4.21	4.18	4.20	4.25	4.25
R	0.09	0.12	0.14	0.24	0.15	0.28	0.06	0.15	0.09	0.15	0.21	0.20	0.17

Subject Code: R16CE2102

II B.Tech I Semester Regular Examinations, Nov-2017.
BUILDING MATERIALS AND CONSTRUCTION
(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Write a short note on Stone Quarrying
- (b) Write a short note on Defects in timber
- (c) Write a short note on Bogues compounds
- (d) Write a short note on Madras terrace roof
- (e) What are the uses of Damp proofing materials
- (f) What are the functions of mat foundation

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Discuss the properties of common building stones
- (b) Explain the process of manufacturing bricks by Clamp burning with the help of a neat sketch
3. (a) Explain in detail about Rubble Masonry with the help of neat sketch
- (b) With the help a neat sketch, explain in detail about the Structure of a Tree
4. (a) What are the Constituents of a limestone and explain them
- (b) Explain about the Standard Consistency test of Cement
5. (a) Write a note on Concrete flooring and Terrazzo flooring
- (b) Explain briefly about the different types of Stair cases
6. (a) Explain about different types of Scaffolding
- (b) What are the types of Paints and explain them
7. (a) Explain about Spread and Combined foundation
- (b) What are the requirements of a good foundation

Subject Code: R16CE2103

II B.Tech I Semester Regular Examinations, Nov-2017.
BUILDING PLANNING AND DRAWING
(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answer any Three questions from Part-A

Answer One Question from Part-B

PART-A

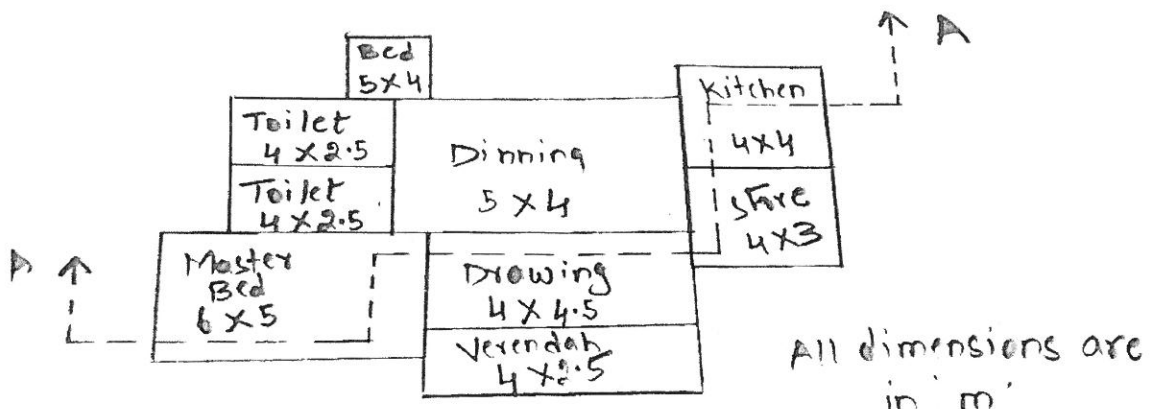
12 X 3 = 36

- Write a short note on
 - Open Space requirements
 - Built up area limitations
- Discuss the characteristics of various types residential buildings
- Explain in detail with a neat sketch about planning of educational institutions
- With the help of sketches explain the principles concerned with the planning of
 - Dispensaries
 - Industrial buildings
- Explain the principles of building byelaws (6)
 - Explain about the Directions and their characteristics (6)

PART-B

24 X 1 = 24

- Draw neat conventional signs for the following items (in 40mm X 40mm blocks)
 - i) Brick ii) Plaster iii) Concrete iv) Timber
 - Draw the plans of English Bond odd and Even courses of one and half brick walls in thickness at the junction of a corner (300mm thickness)
- The line sketch of the plan of a residential building is shown in below figure
Draw (i) A neat dimensional plan (ii) Sectional elevation along A-A Specifications:
Foundation: CC 1:3:6, 400 mm wide thick and 1600 mm wide, depth of foundation is 1200mm below the ground level. Basement coarse Rubble Masonry : 500mm wide and 800mm high
Superstructure : Brick work in CM 1:6, 400mm wide and 400mm high , RCC roofing : 100mm thick Provide door, windows, ventilators, lintels and sunshades as per standard dimensions



Subject Code: R16CE2104**II B.Tech I Semester Regular Examinations, Nov-2017.****SURVEYING - I****(CE)****Time: 3 hours****Max Marks: 60**Question Paper Consists of **Part-A** and **Part-B**.Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Differentiate between plan and map.
- (b) What are the instruments required for a chain survey?
- (c) The fore bearing of a line PQ is N 28° W. What is its back bearing?
- (d) Define benchmark and reduced level.
- (e) Define Contour and contour interval.
- (f) What is plane table surveying? When is it preferred?

[2+2+2+2+2+2]**PART-B****4 X 12 = 48**

2. (a) Explain the classification of surveying based on instruments.
- (b) What is ranging? Explain about indirect ranging.
3. (a) Explain about the working principle and use of the optical square.
- (b) A survey line BAC crosses a river; A and C being the near and opposite banks respectively. A perpendicular AD, 40 meters long is set out at A. If the bearings of AD and DC are 38°45' and 278°45' respectively, find the width of the river.
4. (a) Write the differences between prismatic compass and surveyors compass.
- (b) Find which stations are affected by local attraction and work out correct bearings of the lines of a closed traverse ABCDEA.

Line	AB	BC	CD	DE	EA
F.B	191° 30'	69° 30'	32° 15'	262° 45'	230° 15'
B.B	13° 0'	246° 30'	210° 30'	80° 45'	53° 00'

5. (a) Briefly explain about profile levelling.
- (b) The following consecutive readings were taken with the help of a dumpy level:
1.904, 2.653, 3.906, 4.026, 1.964, 1.702, 1.592, 1.261, 2.542, 2.006, 3.145.

The instrument is shifted after the fourth and seventh readings. The first reading was taken on the staff held on the B.M of R.L. 50.000m. Rule out a level page book and calculate all R.L's by rise and fall method. And apply necessary checks.

6. (a) Explain about the characteristics of contours.
- (b) Explain about the indirect methods of contouring.
7. (a) Explain about the three point problem in plane table surveying.
- (b) Write the advantages and limitations of plane table surveying.

Subject Code: R16CE2105

II B.Tech I Semester Regular Examinations, Nov-2017.**FLUID MECHANICS****(CE)****Time: 3 hours****Max Marks: 60**Question Paper Consists of **Part-A** and **Part-B**.Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is the difference between dynamic viscosity and kinematic viscosity? State their units of measurements?
- (b) Define Total pressure and Centre of pressure?
- (c) Define local acceleration and convective acceleration?
- (d) Explain momentum principle?
- (e) Define Cc and Cv for an orifice?
- (f) Define total energy line and hydraulic gradient line?

[2+2+2+2+2+2]**PART-B****4 X 12 = 48**

2. (a) Explain briefly the following terms: (i) Viscosity (ii) Surface tension (iii) Capillarity and state their significance?
- (b) A vertical cylinder of diameter 180mm rotates concentrically inside another cylinder of diameter 181.2mm. Both the cylinders are 300mm high. The space between the cylinders is filled with a liquid whose viscosity of the fluid if a torque of 20Nm is required to rotate the inner cylinder at 120rpm.
3. (a) Derive Pascal's Law and give some examples where this principle is applied.
- (b) A cubical tank has sides of 1.5m. It contains water for the lower 0.6m depth. The upper remaining part is filled with oil of specific gravity 0.9. Calculate for one vertical side of the tank of total pressure and position of centre of pressure.
4. (a) Derive the three dimensional Continuity Equation in Cartesian coordinate system.
- (b) Define velocity potential and stream function? If the expression for the stream function is described by $\psi = x^3 - 3xy^2$, indicate whether the flow is rotational or irrotational. If the flow is irrotational, determine the velocity potential?
5. (a) Derive Euler's equation of motion along a stream line and hence derive the Bernoulli's equation? State the significance of each term in equation?
- (b) Water is flowing through a pipe diameter 30cm. The pipe is inclined and a venturimeter inserted in the pipe. The diameter of venturimeter at throat is 15cm. The difference of pressure between inlet and throat of venturimeter measured by a liquid of specific gravity 0.8. In an inverted U-tube which gives a reading of 40cm. The loss of head between inlet and throat is 0.3 times kinetic head of the pipe. Find the discharge.

6. (a) Distinguish between a small orifice and large orifice? Derive the equation for discharge through a large rectangular orifice.
- (b) Water flows over a rectangular weir 1m wide at a depth of 150mm and afterwards passes through a triangular right-angled weir. Taking C_d for the rectangular weir as 0.62 and 0.59 respectively, find the depth over the triangular weir.
7. (a) Explain with the help of neat sketch of Pipes in series and Pipes in parallel.
- (b) A 0.3 m diameter pipe 2340 m long is connected with a reservoir whose surface is 72m above the discharging end of the pipe. If for the last 1170m, a second pipe of the same diameter be laid beside the first and connected to it, what would be the increase in the discharge? Take $f=0.02$.

Subject Code: R16CE2106

II B.Tech I Semester Regular Examinations, Nov-2017.

MECHANICS OF SOLIDS

(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

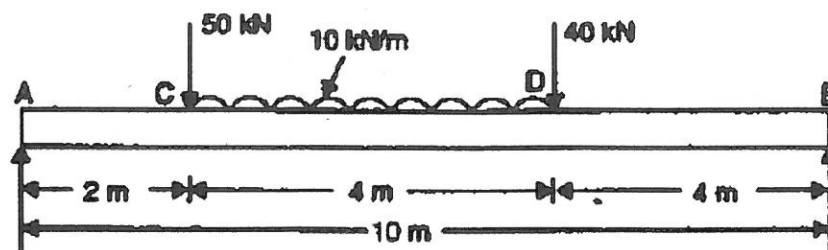
PART-A

1. (a) Write the relation between young's modulus, rigidity modulus and bulk modulus.
- (b) What are principal planes and principal stresses?
- (c) What is the maximum bending moment for the simply supported beam subjected to full UDL and where it occurs?
- (d) Draw the shear stress distribution for rectangular section
- (e) Write about limitations of Euler's theory
- (f) Write equation for power transmitted by a shaft in terms applied torque

[2+2+2+2+2+2]

PART-B

2. a) A hollow cylinder 2m long has an outside diameter of 50mm and inside diameter of 30mm. If the cylinder is carrying a load of 25kN, find the stress in the cylinder. Find the deformation of the cylinder, if the value of E for cylinder material is 100GPa. (4M)
- b) Three bars made of copper, zinc and aluminium are of equal length having cross section 500,700 and 1000 sq.mm respectively. They are rigidly connected at their ends. If this compound member is subjected to axial pull of 200kN. Estimate the load in each wire and induced stresses. Take the value of E for copper = 1.3×10^5 N/mm², for zinc = 1×10^5 N/mm² and for aluminium = 0.8×10^5 N/mm² (8M)
3. a) Write short note on maximum shear stress theory and maximum strain energy theory. (5M)
- b) At a point in an elastic material, a direct tensile stress of 60 N/mm² and a direct compressive stress of 40 N/mm² are applied on planes at right angle to each other. If the maximum principal stresses are limited to 75 N/mm² (tensile). Find the shear stress that may be allowed on the planes. Also determine the minimum principal stress and the maximum shear stress and their planes. (7M)
4. A simply supported beam of length 10m carries the uniformly distributed load and two point loads as shown in figure. Draw the shear force and bending moment diagrams and find maximum bending moment. (12M)



5. a) A timber beam 150mm x 250mm in cross section is simply supported at ends and has a span of 3.5m. The maximum allowable stress in bending is 7500 kN/m^2 . Find the maximum safe UDL which the beam can carry. (6M)
b) Derive flexure formula. (6M)
6. (a) Derive the equation for the crippling load for a column with one end fixed and other free. (6M)
(b) Find buckling load for a column which is fixed at both ends. Length of column = 5m, 300mm x 350mm size, $E = 2 \times 10^5 \text{ N/mm}^2$ (6M)
7. a) A cylindrical shell, 0.8m in diameter and 3m long is having 10mm wall thickness. If the shell is subjected to an internal pressure of 2.5MPa, determine (a) change in diameter (b) change in length (c) change in volume. Take $E = 200 \text{ GPa}$ and $\mu = 0.25$. (9M)
b) Write torsion equation and list out assumptions. (3M)

1.