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3E1103

Roll No. _____

Total No of Pages: 3

3E1103

B. Tech. III - Sem. (Main) Exam., Dec. - 2018

HSMC

3AN1 – 03 Managerial Economics & Financial Accounting

All branches (CE/EE/ME)

Time: 2 Hours

Maximum Marks: 80

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____

2. NIL _____

PART – A

(Answer should be given up to 25 words only)

[5×2=10]

All questions are compulsory

- Q.1 Define Managerial Economics.
- Q.2 Explain Break Even point.
- Q.3 Explain Balance sheet.
- Q.4 Define Macro Economics
- Q.5 What is the purpose of Demand Forecasting?

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PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

Q.1 Airline XYZ has reported the following earnings to its shareholders for financial year

17 – 2018, as given below –

- (a) Net profit before tax: ₹ 100000000/- (in words Rs One crore only)
- (b) Taxation at 50% of net profit
- (c) Equity share capital (₹ 10/- per share) ₹ 1,00000000/- (in words ₹ One Crore only)

Calculate the earnings per share for the shareholders.

Q.2 What is Oligopoly? Explain the features of Oligopoly Market.

Q.3 Explain a Civilian passenger aircraft lifecycle approach for Cost – Benefit analysis.

Q.4 What do you understand by a Balance Sheet and its related concepts?

Q.5 Explain in brief the various capital budgeting techniques.

Q.6 What is demand function? How do you determine it?

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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [2×15=30]

Attempt any two questions

Q.1 A private SME manufactures tyres for HAL and has reported the following information for two successive years –

	Year 1	Year 2
Sales	₹ 500 CRORE	₹ 1200 CRORE
Fixed Costs	₹ 100 CRORE	₹ 200 CRORE
Variable Costs	₹ 300 CRORE	₹ 600 CRORE

Determine: (a) Break – even point

(b) Margin of Safety

Q.2 Explain how do you measure elasticity of demand.

Q.3 What are various types of capital budgeting techniques?

3E1131

Roll No. _____

Total No of Pages: 4

3E1131

B. Tech. III - Sem. (Main) Exam., Dec. - 2018

ESC Civil Engineering

3CE3 – 04 Engineering Mechanics

Time: 2 Hours

Maximum Marks: 80

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

PART – A

(Answer should be given up to 25 words only)

[5×2=10]

All questions are compulsory

- Q.1 State the triangle law of forces. [2]
- Q.2 Differences between truss and frame. [2]
- Q.3 What is co-efficient of friction? [2]
- Q.4 Differentiate between close coiled helical and open coiled spring. [2]
- Q.5 Explain the principle of conservation of energy. [2]

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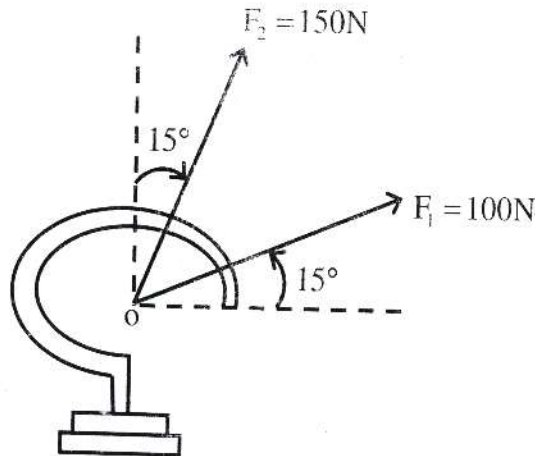
PART - B

(Analytical/Problem solving questions)

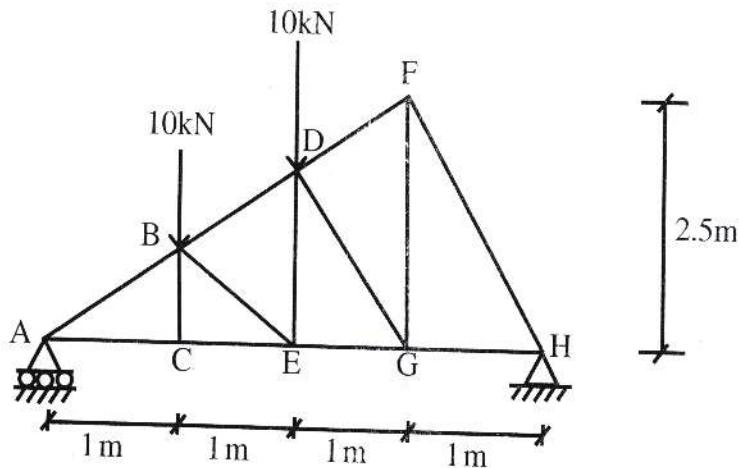
[4×10=40]

Attempt any four questions

- Q.1 An eye bolt as shown in figure below is subjected to two forces $F_1 = 100 \text{ N}$ and $F_2 = 150 \text{ N}$. Determine the magnitude and direction of resultant force. [10]



- Q.1 Write the basic assumption made in analysis of a truss. For the simply supported truss shown as figures. Find the forces BD, DE, EG & CE using the method of section. [10]



- Q.3 Prove the statement that loss of one form of energy is equal to the gain in other form of energy and total energy remains constant. [10]

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Q.4 A semi elliptical laminated spring has the following data:

[10]

Length of longest plate = 500 mm

Deflection at the center = 20 mm

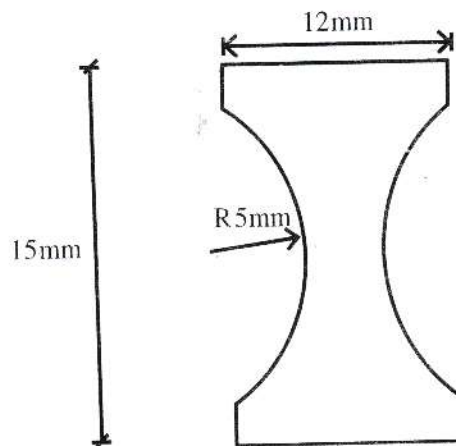
Permissible bending stress = 200 MPa

Determine the size of strip, number of plates and radius of curvature. Assume that the width of plate is 10 times the thickness of plate. Take

$$E = 2 \times 10^5 \text{ N/mm}^2$$

Q.5 The cross section of cast iron beam shown in fig. Determine the moments of inertia of section about horizontal & vertical axis passing through the centroid of the section.

[10]



Q.6 Show that the relation between the tensions in the belt on the tight side and slack side is

[10]

$$\frac{T_1}{T_2} = e^{\mu\theta}$$

PART - C

(Descriptive/Analytical/Problem Solving/Design Question)

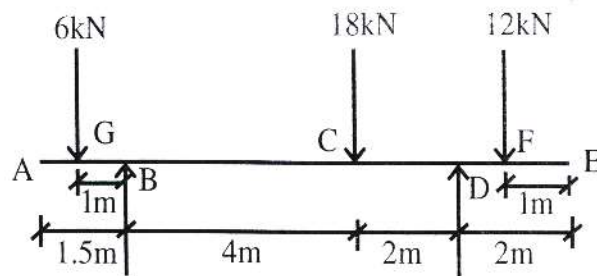
[2×15=30]

Attempt any two questions

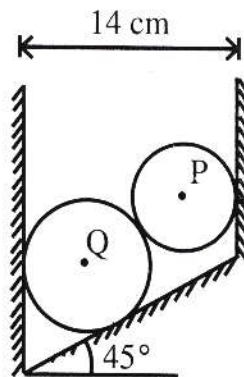
Q.1 (a) State the principle of virtual work and explain concept of virtual work and virtual displacement with an example.

[8]

- (b) Determine the reaction at support by principle of virtual work for the beam shown in fig. [7]



- Q.2 (a) Setup a relation for volumetric strain of a rectangular or cylindrical bar subjected to axial force in terms of longitudinal strain & Poisson's ratio. [8]
- (b) The air vessel of a torpedo having an external diameter of 500 mm is 10 mm thick, has a length of 1.8 m. Determine the increase in its external diameters and length it is charged to 10 N/mm^2 . Take $E = 200 \times 10^9 \text{ N/m}^2$. Poisson's ratio = 0.3. [7]
- Q.3 (a) State and derive the expression for parallelogram law of forces. [7]
- (b) Two spheres of diameter 12 cm and 4 cm rest on three planes as shown in fig. The weight of the bigger sphere is 40 N and that of smaller one 20 N. Determine the normal reaction of the plane and the reactions between the spheres. [8]



3E1132

Roll No. _____

Total No of Pages: 4**3E1132****B. Tech. III - Sem. (Main) Exam., Dec. - 2018****PCC Civil Engineering****3CE4 – 05 Surveying****Time: 3 Hours****Maximum Marks: 120***Instructions to Candidates:**Attempt all ten questions from Part A, selecting five questions from Part B and four questions from Part C.**Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.**Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*1. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

- Q.1 What is surveying? [2]
- Q.2 What do you mean by local Attraction? [2]
- Q.3 What do you mean by Benchmark? [2]
- Q.4 What do you mean by Reduced level? [2]
- Q.5 What is circular curve? [2]
- Q.6 What do you mean by Tangent correction? [2]
- Q.7 Give any two advantage of Tacheometric Surveying. [2]
- Q.8 What is aerial photographs? [2]
- Q.9 Give any two advantage of Total station. [2]
- Q.10 Give type of E.D.M. [2]

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PART – B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

Q.1 A tape 20 m long of standard length at 84 °F was used to measure a line, the mean temperature during measurement being 70°. The measured distance was 875.10 meters.

The following being the slopes:

[8]

2°10'	For	90 m
4°12'	For	150 m
1°6'	For	50 m
7°48'	For	200 m
3°0'	For	300 m
5°10'	For	80.15 m

Find the true length of the line if the co-efficient of expansion is 65×10^{-7} per 1°F.

Q.2 The following bearings were observed while traversing with a compass.

[8]

Line	AB	BC	CD	DE
F.B	45°65'	96°55'	29°45'	324°48'
B.B	220°10'	277°5'	209°10'	144°48'

Mention which stations were affected by local attraction and determine the corrected bearing.

Q.3 (a) Convert the following whole circle bearing to quadrant bearing

[4]

(i) $22^{\circ}30'$

(ii) $170^{\circ}12'$

(iii) $211^{\circ}54'$

(iv) $315^{\circ}24'$

(b) Convert the following quadrant bearing to whole circle bearing.

[4]

(i) N $12^{\circ}24'$ E

(ii) S $31^{\circ}36'$ E

(iii) S $68^{\circ}6'$ W

(iv) N $5^{\circ}42'$ W

Q.4 The following staff readings were observed successively with a level, the Instrument having been moved after third, sixth and eighth readings: 2.20; 1.606; 0.898; 2.090; 2.880; 1.255; 0.602; 1.982; 1.044; 2.684 meters.

[8]

Enter the above readings in a page of a level book and calculate the R.L. of points if the first reading was taken with a staff held on a bench mark of 432.384 m.

Q.5 Find the error of reading of a level staff if the observed reading is 3.845 m at The point sighted, the staff being 15 cm off the vertical through the bottom.

[8]

Q.6 Determine the gradient from a point A to a point B from the following observation made with a tacheometer fitted with an anallatic lens. The constant of the instrument was 100 and the staff held vertically.

[8]

Instrument station	Staff point	Bearing	Vertical angle	Staff reading
P	A	134°	$+12^{\circ}32'$	1.360, 1.915, 2.47
	B	224°	$+6^{\circ}6'$	1.065, 1.885, 2.705

Q.7 A tacheometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertical held staff. [8]

Staff station	Vertical Angle	Staff intercept	Axial hair readings
P	$+7^{\circ}36'$	2.350	2.105
Q	$+6^{\circ}8'$	2.055	1.895

The instrument is fitted with an anallactic lens and the constant is 100. Compute the length of PQ and reduced level of Q that of P being 320.21 meters.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

- Q.1 Draw neat and clean sketch of a dumpy level and explain its working and uses in leveling. [15]
- Q.2 Write corrections applied to length measurement with chain or tape. [15]
- Q.3 Enumerate the classification of surveys based on equipment used. What are the applications of chain and compass survey? [15]
- Q.4 What is E.D.M.? Explain Principle of E.D.M. and also types of E.D.M. [15]
- Q.5 What is Total Station? Explain parts of Total Station. [15]
-

Roll No. _____

Total No of Pages: 4**3E1133****3E1133****B. Tech. III - Sem. (Main) Exam., Dec. - 2018****PCC Civil Engineering
3CE406 Fluid Mechanics****Time: 2 Hours****Maximum Marks: 80***Instructions to Candidates:**Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.**Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.**Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*1. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[5×2=10]****All questions are compulsory**

Q.1 State Newton's law of viscosity.

Q.2 What do you understand by total pressure and center of pressure?

Q.3 Define compressibility.

Q.4 Define vena-contract.

Q.5 What do you understand by kinetic energy correction and momentum correction factors?

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PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 Derive an expression for the depth of center of pressure from free surface of liquid of an inclined plane surface submerged in liquid.
- Q.2 If for a two dimensional potential flow, the velocity potential is given by $\phi = x(2y - 1)$. Determine the velocity at the point P (4, 5). Also determine the value of stream function ψ at the point P.
- Q.3 A differential manometer is connected at two points A and B of two pipe as shown in fig. no. 1. The pipe A contains a liquid of sp. gravity = 1.5 while pipe B contains a liquid of sp. gravity = 0.9. The pressure at A and B are 1 kgf/cm^2 and 1.8 kgf/cm^2 respectively. Find the difference in mercury level in the differential manometer.

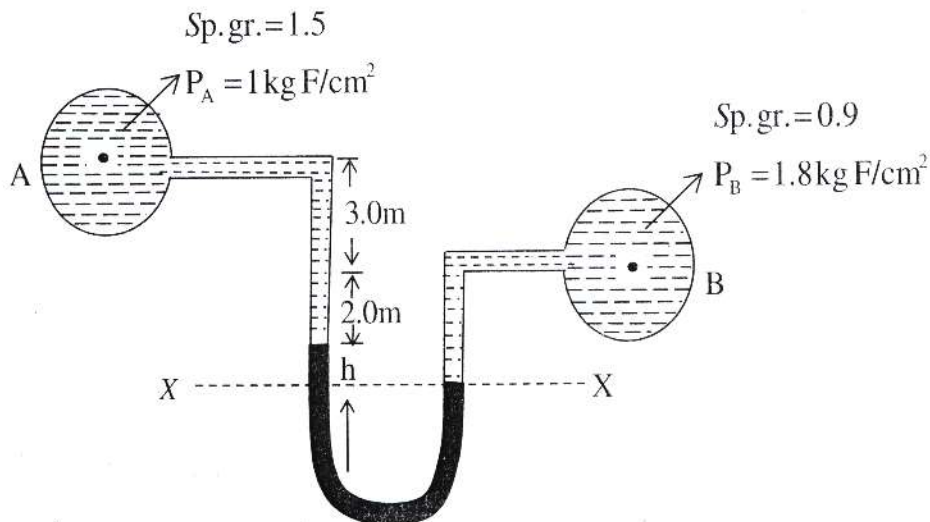


Fig - No. - 1

- 65
- Q.4 What is a venturimeter? Drive an expression for the discharge through venturimeter.
- Q.5 A crude oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 100 mm and of length 10 m. Calculate the difference of pressure at the two ends of the pipe, if 100 kg of the oil is collected in a tank in 30 seconds.
- Q.6 A reducer bend having an outlet diameter of 15 cm discharge freely. The bend connected to a pipe of 20 cm diameter, has deflection of 60° and lies in a horizontal plane. Determine the magnitude and direction of force on the anchor block supporting the pipe when discharge of $0.3 \text{ m}^3/\text{s}$ passes through the pipe.

PART – C

(Descriptive/Analytical/Problem Solving/Design Question) **[2×15=30]**

Attempt any two questions

- Q.1 A horizontal pipe line 40 m long is connected to a water tank at one end and discharge freely into the atmosphere at the other end. For the first 25 m of its length from the tank, the pipe is 150 mm diameter and its diameter is suddenly enlarged to 300 mm. The height of water level in the tank is 8 m above the centre of the pipe. Considering all losses of head which occur, determine the rate of flow. Take $F = 0.01$ for both sections of the pipe.
- Q.2 Find the convective acceleration at the middle of a pipe which converges uniformly from 0.4 m diameter to 0.2 m diameter over 2 m length. The rate of flow is 20 l/s. If the rate of flow changes uniformly from 20 l/s. to 40 l/s in 30 seconds, find the total acceleration at the middle of the pipe at 15th second. [7]

Q.3 (a) Drive an expression metacenter height of the floating body.

(b) A rectangular plane surface = 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of 30° with free surface of water. Determine the total pressure and position of center when the upper edge is 1.5 m below the free water surface. [8]

3E1134

Roll No. _____

Total No of Pages: 3**3E1134****B. Tech. III - Sem. (Main) Exam., Dec. - 2018****Civil Engineering****3CE4 – 07 Building Material & Construction****Time: 3 Hours****Maximum Marks: 120***Instructions to Candidates:**Attempt all ten questions from Part A, selecting five questions from Part B and four questions from Part C.**Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.**Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*1. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

Q.1 What is the role of gypsum in manufacturing of cement?

Q.2 What do you understand by tread and rise?

Q.3 Enumerate the different name of foundation.

Q.4 Explain the uses of partition wall.

Q.5 Classify the different types of staircase.

- Q.6 What is the meaning of consistency?
- Q.7 Explain relative merits and demerits of English bond.
- Q.8 Write down the properties of steel.
- Q.9 Explain the terms intrados and extrados in arch.
- Q.10 List out the name of materials which are used for damp proofing.

PART – B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

- Q.1 Explain various test to be conducted on bricks.
- Q.2 What do you understand by seasoning of timber? Explain various methods of seasoning?
- Q.3 Differentiate between king post roof truss and queen post roof truss with neat sketch.
- Q.4 Describe the types of stairs case and their suitability.
- Q.5 With the help of neat sketches describes underpinning.
- Q.6 Distinguish clearly between a lintel and an arch. Explain with sketch RCC lintel.
- Q.7 What are the different causes of dampness in building?

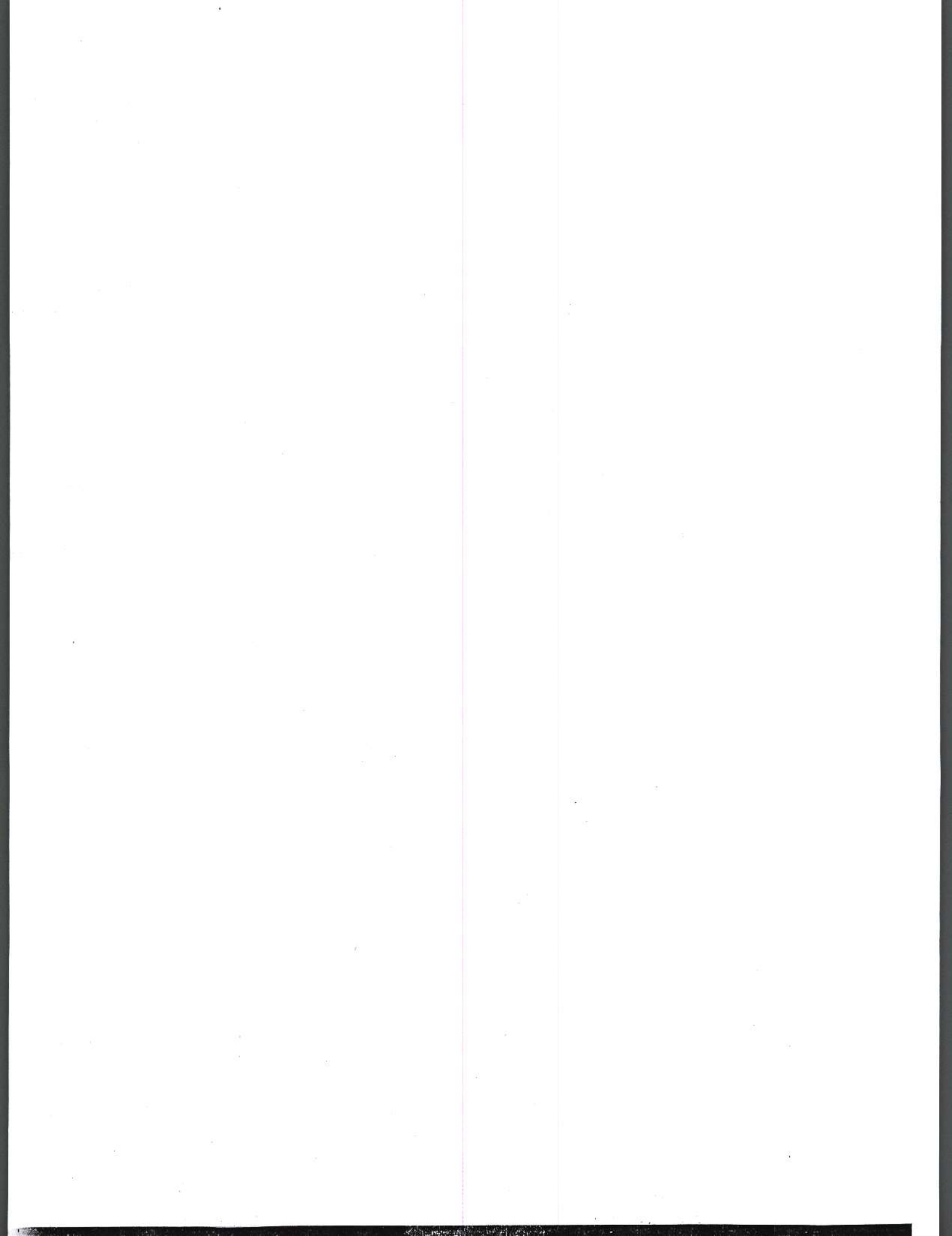
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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

- Q.1 What are the objectives of joints? Discuss in brief construction & expansion joints with neat sketch.
- Q.2 Explain the term foundation. Enumerate various types of building foundation.
- Q.3 Describe the types of roof covering material with construction details.
- Q.4 Discuss the load bearing and framed structure of construction in detail.
- Q.5 Explain the following:-
- (a) Anti termite treatment
 - (b) Fire resistance construction
 - (c) Layout of foundation plan
-



3E1135

Roll No. _____

Total No of Pages: 2**3E1135****B. Tech. III - Sem. (Main) Exam., Dec. - 2018****PCC Civil Engineering****3CE4 - 08 Engineering Geology****Time: 2 Hours****Maximum Marks: 80***Instructions to Candidates:**Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.**Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.**Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*1. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[5×2=10]****All questions are compulsory**

Q.1 Define the term weathering? [2]

Q.2 What do you understand by the term remote sensing? [2]

Q.3 What is petrology? [2]

Q.4 Explain the term river meandering with diagram. [2]

Q.5 Write in brief about the electromagnetic spectrum. [2]

PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 Discuss the geological time scale. [10]
- Q.2 Define metamorphism and explain the various structure and texture of metamorphic rocks. [10]
- Q.3 What is unconformity? Describe the different types of unconformities, [10]
- Q.4 Write short notes on: [5×2=10]
- (a) Sensors and its types
 - (b) Origin & formation of sedimentary rocks.
- Q.5 Discuss the geophysical methods for sub-surface exploration along with its importance in civil engineering. [10]
- Q.6 What do you understand by the term GIS and also discuss the various stages of capturing aerial photograph. [10]

PART – C

(Descriptive/Analytical/Problem Solving/Design Question)

[2×15=30]

Attempt any two questions

- Q.1 What is fault? Describe the various types of faults along with neat sketch. [15]
- Q.2 Explain in detail about the seismic methods for sub-surface investigation. [15]
- Q.3 Describe the following: [5×3=15]
- (a) Satellite imagery and aerial photograph
 - (b) Filters and its types
 - (c) Folds and its types

3E1621

Roll No. _____

Total No of Pages: 3

3E1621

B. Tech. III - Sem. (Mercy Back) Exam., Dec. - 2018

Civil Engineering

3CE1A Strength of Materials - I

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL

2. NIL

UNIT-I

- Q.1 (a) Define stress. Explain direct stress, shear stress, bending stress, torsional stress and thermal stress. [2+6=8]
- (b) Define strain. Explain tensile strain, compressive strain, shear strain and volumetric strain. [2+6=8]

OR

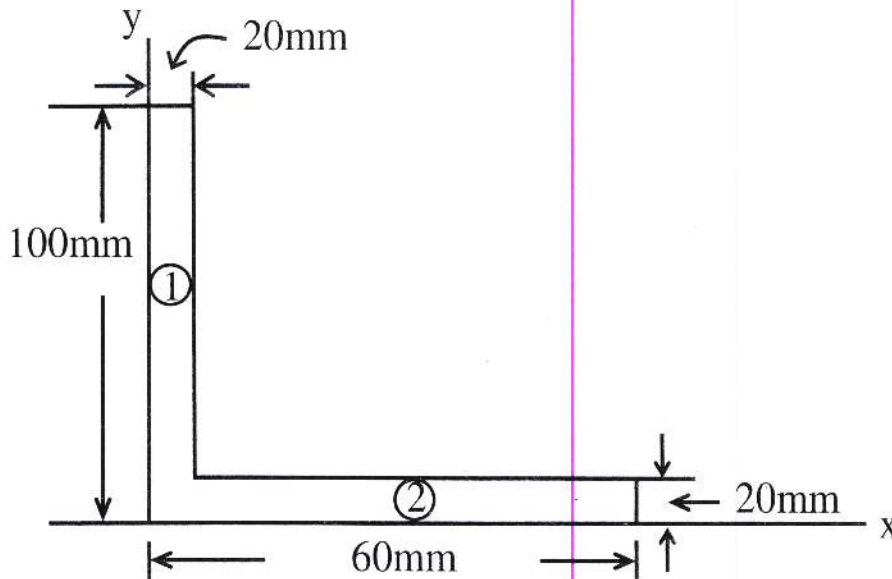
- Q.1 (a) A rod 2 m long and diameter 30 mm is subjected to an axial pull of 30 kN. If the young's modulus of material of rod is $2 \times 10^6 \text{ N/mm}^2$, determine [8]
- (i) Stress
- (ii) Strain
- (iii) Elongation of the rod.
- (b) Explain stress strain curve with neat sketch. [8]

UNIT- II

- Q.2 A rectangular block 10 cm×5 cm in section is subjected to a tensile load of 500 kN. Determine the normal stress and shear stress on an oblique plane making an angle of 30° with the length of the block. [16]

OR

- Q.2 Find the C.G. of an angle section 100 mm × 60 mm × 20 mm as shown in figure. [16]



UNIT- III

- Q.3 (a) Define column, strut, slenderness ratio, Buckling load. [8]
(b) Explain classification of columns. [8]

OR

- Q.3 (a) A round bar 4 m long and 60 mm in diameter is used as a strut with both ends hinged. Determine the crippling load. [8]
Take $E = 2 \times 10^5 \text{ N/mm}^2$
(b) Explain the assumptions made in the Euler's theory and validity of Euler's theory. [8]

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UNIT- IV

Q.4 (a) Explain various types of support. [8]

(b) Explain determinate and indeterminate structures. [8]

OR

Q.4 A simply supported beam of 16 m effective span carries concentrated loads of 400 N, 500 N and 300 N at distances 3 m, 7 m, and 11 m respectively from left support. Draw shear force diagram and bending moment diagram. [16]

UNIT- V

Q.5 (a) Explain Theory of Simple Bending (Bending equation). Write down the assumptions made in the theory of simple bending. [5+3=8]

(b) Explain moment of resistance and section modulus. [8]

OR

Q.5 A rectangular beam 300 mm deep is simply supported over a span of 4 m. What uniformly distributed load per meter the beam may carry, if the bending stress is not to exceed 120 N/mm^2 . Take $I = 8 \times 10^5 \text{ mm}^4$. [16]

3E1622

Roll No. _____

Total No of Pages: 2

3E1622

B. Tech. III - Sem. (Main / Back) Exam., Dec. - 2018

Civil Engineering

3CE2A Civil Engineering Materials - I

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT- I

- Q.1 (a) Explain the properties and uses of common building stones like Marble, granite, sandstone, limestone. [8]
- (b) Discuss the durability and impact value test in detail. [8]

OR

- Q.1 (a) Write about the dressing of stones. [8]
- (b) Discuss the Quarrying of stones. [8]

UNIT- II

- Q.2 Discuss the manufacturing process of bricks in detail with fig. [16]

OR

- Q.2 Write about flyash properties, classification, and use in brick and cement manufacturing. [16]

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UNIT- III

Q.3 Discuss in detail various Laboratory tests on cement with figures. [16]

OR

Q.3 Discuss in detail the manufacturing process of Lime with figures. [16]

UNIT- IV

Q.4 (a) Write about types of sand and bulking of sand. [8]

(b) Draw the figures of various types of pointing. [8]

OR

Q.4 Discuss the method of seasoning of wood, fire proofing methods, and detail about ply woods. [16]

UNIT- V

Q.5 Write about the concept of embodied energy of material and energy used in transportation and construction process. [16]

OR

Q.5 Write in detail about blast furnace slag, stabilized blocks, rice husk ask, rammed earth. [16]

3E1623

Roll No. _____

Total No of Pages: 2

3E1623

B. Tech. III - Sem. (Main / Back) Exam., Dec. - 2018

Civil Engineering

3CE3A Engineering Geology

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 26/24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT- I

- Q.1 (a) Discuss about Geological Work by River action and describe various features form by erosion & deposition. [8]
- (b) Write short note on Importance of Geology for Civil Engineers. [8]

OR

- Q.1 (a) Draw & describe Internal structure of the Earth. [8]
- (b) Discuss about various physical properties of mineral. [8]

UNIT- II

- Q.2 (a) Describe Texture & Structure of Igneous Rocks. [8]
- (b) Describe classification of Sedimentary Rocks. [8]

OR

- Q.2 (a) Describe various Forms of Igneous Rocks. [8]
(b) Describe various structure of Metamorphic Rocks. [8]

UNIT- III

- Q.3 (a) Write an essay on classification of Fold. [8]
(b) How to recognize fold in the field. [8]

OR

- Q.3 (a) Define dip & strike with neat sketch. [8]
(b) A bed dip at the rate of line 10 direction S10°W. What will be the inclination of a road driven in direction S50°W. [8]

UNIT- IV

- Q.4 Describe geological considerations for the site selection of Tunnels. [16]

OR

- Q.4 Discuss about Electrical Resistivity method for Geological Investigation of any area. [16]

UNIT- V

- Q.5 Application of remote sensing in various fields of Civil Engineering. [16]

OR

- Q.5 Write short note on any two –
(a) G.I.S. System [8]
(b) Remote Sensing System [8]
(c) Aerial Photograph & Satellite Imagery [8]
-

3E1624

Roll No. _____

Total No of Pages: 3**3E1624****B. Tech. III - Sem. (Main / Back) Exam., Dec. - 2018****Civil Engineering****3CE4A Construction Technology****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 26***Instructions to Candidates:*

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL

UNIT- I

Q.1 (a) Explain following (with diagram) -

(i) King Closer [2](ii) Queen Closer [2](iii) Mitred Closer [2](iv) Bevelled Closer [2]

(b) What do you understand by Brick Bonds? Explain the comparison of English Bond and Flemish Bond with suitable diagram. [8]

OR

- Q.1 (a) What is Shoring? What are the different types of Shores? Explain with neat diagram. [10]
- (b) Explain the importance of Arches over Lintels. [6]

UNIT- II

- Q.2 (a) What do you understand by Lift slab Construction? [8]
- (b) What are the requirements of a good staircase? [8]

OR

- Q.2 (a) What do you understand by Expansion joints? Why they are used in building construction. [8]
- (b) Explain methods of Damp proofing treatment for a residential building. [8]

UNIT- III

- Q.3 (a) How to erect the precast concrete structures? Explain the procedure. [6]
- (b) Explain the construction of concrete floor with the help of diagram. [10]

OR

- Q.3 (a) Explain the technical terms of a pitched roof with neat diagram. [8]
- (b) How to reduce the overturning effect of a pitched roof? Explain. [8]

UNIT- IV

- Q.4 (a) Explain following-
- (i) Hauling Equipment [3]
- (ii) Hoisting Equipment [3]
- (b) What is Grouting equipment? Where it is used? Explain its working with diagram. [10]

OR

- Q.4 (a) Explain different types of heavy earth moving equipments. [8]
- (b) How the latest construction equipments has affected the working of construction industry? Explain. [8]

UNIT- V

- Q.5 (a) How would you identify the output and capacity of any equipment for a specific work? Explain. [8]
- (b) How the replacement of equipment is managed during breakdown? Explain. [8]

OR

- Q.5 What is maintenance management? What are different types of maintenances? Explain. [16]
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3E1625

Roll No. _____

Total No of Pages: 4**3E1625****B. Tech. III - Sem. (Main / Back) Exam., Dec. - 2018****Civil Engineering****3CE5A Fluid Mechanics****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 26***Instructions to Candidates:*

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL**UNIT- I**

Q.1 (a) Differentiate between:

(i) Newtonian and Non-Newtonian fluid [2]

(ii) Specific weight and specific volume [2]

(iii) Dynamic and kinematic viscosity [2]

(b) If the velocity profile of a fluid over a plate is parabolic with the vertex 20 cm from the plate, where the velocity is 120 cm/sec. Calculate the velocity gradients and shear stresses at a distance of 0, 10 and 20 cm from the plate, if the viscosity of the fluid is 8.5 poise. [10]

OR

- Q.1 (a) Derive the equation of capillary rise, stating meaning of terms used with neat sketches. [8]
- (b) Determine the mass and the weight of the air contained in a room whose dimensions are $6\text{m} \times 6\text{m} \times 8\text{m}$. Assume the density of air is 1.16 kg/m^3 . [8]

UNIT- II

- Q.2 (a) A tank contains water up to a height of 0.5m above the base. An immiscible liquid of specific gravity 0.8 is filled on the top of water up to 1m height, calculate: [8]
- (i) Total pressure on one side of the tank
- (ii) The position of center of pressure for one side of the tank, which is 2 m wide.
- (b) Draw the neat sketch of Bourdon's pressure gauge and explain its working. [8]

OR

- Q.2 (a) Define meta centric height. A wooden block is 40cm long, 20cm wide and 15cm deep floats in water with shortest axis vertical. Calculate it's meta centric height and show that it is in stable equilibrium. Take 12cm as depth of immersion. [8]
- (b) Determine the horizontal and vertical components of the force acting on a semicircular gate of 2m diameter and 3m length, when water stands up to its top. [8]

UNIT- III

- Q.3 (a) What is flow net? What are the methods of drawing flow net? Mention some applications of flow net. [8]
- (b) If for a 2-D potential flow, the velocity potential is given by $\phi = 4x(3y-4)$. Determine the velocity at the point (2, 3). Determine also the value of stream function ψ at the point (2, 3). [8]

OR

- Q.3 (a) Drive Euler's equation of motion along a stream line for an ideal fluid flow stating assumptions. [8]
- (b) A jet of water from a 25mm diameter nozzle is directed vertically upwards. Assuming that the jet remains circular and neglecting any loss of energy that will be diameter at a point 4.5m above the nozzle, if the velocity with which the jet leaves the nozzle is 12 m/sec. [8]

UNIT- IV

- Q.4 (a) Derive an expression for a discharge through a rectangular notch. [8]
- (b) A horizontal venturimeter with inlet diameter 20cm and throat diameter 10cm is used to measure the flow of water. The pressure at inlet is 17.658N/cm² and the vacuum pressure at the throat is 13cm of mercury. Find the discharge of water through venturimeter. Take $C_d = 0.98$ [8]

OR

- Q.4 (a) What is Cipoletti's weir? Prove that the discharge through Cipoletti's weir is given by- [8]
- $$Q = \frac{2}{3} C_d L \sqrt{2g} H^{3/2}, \text{ where } L = \text{Length of weir, } H = \text{Head of water over weir.}$$
- (b) Prove that for viscous flow through a circular pipe the kinetic energy correction factor is equal to 2. [8]

UNIT- V

- Q.5 (a) Derive Darcy-Weisbach formula for determining friction loss in pipe flow. [8]
- (b) A pipe of diameter 250mm and length 4km is used for the transmission of power by water. The total head at the inlet of the pipe is 500m. Find the maximum power available at the outlet of pipe, if the value of $f = 0.008$. Here 'f' is the coefficient of friction. [8]

OR

- Q.5 (a) Distinguish between-
- (i) Laminar & Turbulent flow [4]
- (ii) Flow theory parallel pipes and pipes in series [4]
- (b) Find out the ratio of maximum velocity to average velocity for viscous flow of fluid through circular pipe. [8]
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3E1626

Roll No. _____

Total No of Pages: 3**3E1626****B. Tech. III - Sem. (Mercy Back) Exam., Dec. - 2018****Civil Engineering****3CE6A Advanced Engineering Mathematics****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

*Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL**UNIT- I**Q.1 (a) Find the Fourier series to represent the function $f(x) = x - x^2$ in $(-\pi, \pi)$ [8](b) Find the z - transform of $\{a^n \sin hn\theta\}$ for $n \geq 0$. [8]**OR**

Q.1 (a) Obtain the first three coefficients in Fourier cosine series for y where

x	0	1	2	3	4	5	
y	4	8	15	7	6	2	

(b) Find inverse z - transform of $\frac{1}{(z-3)(z-2)}$ where $|z| < 2$. [8]**UNIT- II**

Q.2 (a) Find -

(i) $L\{t \sin at\}$ [4](ii) $L\{e^t(t+2)^2\}$ [4](b) Find the Laplace transform of $\frac{\sin at}{t}$. Does the transform of $\frac{\cos at}{t}$ exist? [8]

OR

Q.2 (a) Find –

$$(i) \quad L^{-1} \left\{ \frac{4s+5}{(s+1)^2(s+2)} \right\} \quad [4]$$

$$(ii) \quad L \left\{ \frac{\sin^2 t}{t} \right\} \quad [4]$$

$$(b) \quad \text{Solve } (D^2 + 9)y = \cos 2t, \text{ given that } y(0) = 1, y\left(\frac{\pi}{2}\right) = -1 \quad [8]$$

UNIT- III

$$Q.3 (a) \quad \text{Obtain the Fourier transform of } f(x) = \begin{cases} x^2 & |x| \leq a \\ 0 & |x| > a \end{cases} \quad [8]$$

$$(b) \quad \text{Using Fourier cosine transform, solve } \frac{\partial \theta}{\partial t} = c^2 \frac{\partial^2 \theta}{\partial x^2} \text{ subject to}$$

$$(i) \quad \theta = 0 \text{ when } t = 0, x \geq 0$$

$$(ii) \quad \frac{\partial \theta}{\partial x} = -\mu \text{ (a constant) when } x = 0, t > 0 \quad [8]$$

$$\theta(x, t) \text{ and } \frac{\partial \theta}{\partial x} \rightarrow 0 \text{ as } x \rightarrow \infty$$

OR

$$Q.3 (a) \quad \text{Find the Fourier sine and cosine transform of } x^{n-1} \quad [8]$$

$$(b) \quad \text{Using Fourier sine transform solve } \frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}, x > 0, t > 0 \text{ subject to}$$

$$u(0, t) = 0, \quad u(x, 0) = \begin{cases} 1 & 0 < x < 1 \\ 0 & x \geq 1 \end{cases} \quad [8]$$

UNIT- IV

$$Q.4 (a) \quad \text{Prove that } \Delta \log f(x) = \log \left[1 + \frac{\Delta f(x)}{f(x)} \right] \quad [8]$$

$$(b) \quad \text{Use stirling's formula to compute } u_{12.2} \text{ from the table}$$

x_0	10	11	12	13	14
U_x	23967	28060	31788	35209	38368

[8]

OR

Q.4 (a) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.35$ from following table

x	1.1	1.2	1.3	1.4	1.5	1.6	[8]
y	-1.6262	0.1558	2.4526	5.3917	9.1250	13.8307	

(b) Evaluate $\int_0^{\pi/2} \sqrt{\cos \theta} \, d\theta$ by dividing the interval into eight equal parts. [8]

UNIT- V

Q.5 (a) Use modified Euler's method to find y at $x = 0.1$, taking $h = 0.1$, where

$$\frac{dy}{dx} = x^2 + y \text{ and } y = 0.94 \text{ when } x = 0 \quad [8]$$

(b) Evaluate y at 1.1 using Runge-kutta fourth order method for the differential equation-

$$\frac{dy}{dx} = x^2 + y^2, y(1) = 0 \quad [8]$$

OR

Q.5 (a) Apply Picard's method to find the solution of $\frac{dy}{dx} = y - x$ with $x = 0, y = 2$ upto third order of approximation. [8]

(b) Using Milne's method to find $y(0.8)$ from $\frac{dy}{dx} = 1 + y^2, y(0) = 0$. Given that $y(0.2) = 0.2027, y(0.4) = 0.4228, y(0.6) = 0.6841$. [8]
