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B. Tech. 4th Semester (Bio-Tech) Examination – May, 2023

ORGANIZATIONAL BEHAVIOUR

Paper : HSMC-02-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all. Question No. **1** is ***compulsory***. Attempt ***one*** question from each Unit. All questions carry equal marks.

1. Write short notes on the following : $2.5 \times 6 = 15$

(a) Administration

(b) Scope of management

(c) Learning

(d) Importance of Communication

(e) Merits and demerits of Team

(f) Concept of Organisational Change

UNIT – I

2. Who are managers ? Explain their role in context of business enterprise. 15

3. Write short note on following : $7.5 \times 2 = 15$

   (a) Functions of management

   (b) Difference between management and administration

UNIT – II

4. What do you understand by organisation behaviour ? Explain its evolution process, importance and its relationship with other fields. 15

5. Write short notes on following : $7.5 \times 2 = 15$

   (a) Perception

   (b) Challenges and opportunities of OB

UNIT – III

6. Write short note on following : $7.5 \times 2 = 15$

   (a) Channels of communication

   (b) Concept of conflict

7. What do you understand by group ? Explain its development, types and its importance in terms of industrial organisation. 15

UNIT – IV

8. What do you mean by organisational culture ? Explain in detail its elements, types and factors which can affect it. 15

9. Write short notes on the following : $7.5 \times 2 = 15$

   (a) Meaning and types of organisational structure

   (b) Factors affecting organisational change

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B. Tech. 4th Semester (Civil) Examination – May, 2023

HYDRAULIC ENGINEERING

Paper : PCC-CE-202-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Explain the following terms : $2.5 \times 6 = 15$

(a) What do you understand by turbulent flow ?

(b) Kinetic Energy correction Factor.

(c) Hydraulic mean Depth.

(d) Sketch the velocity distribution across a section of pipe.

(e) Hydraulic gradient line.

Name the different forces present in fluid flow.

UNIT – I

2. (a) Derive an expression for velocity distribution for Laminar flow through circular pipe. 7.5

   (b) A laminar flow is taking place in a pipe of diameter 200 mm. The maximum velocity is 1.5 m/s. Find the mean velocity and the radius at which this occurs. 7.5

3. Obtain an Expression for velocity distribution in turbulent flow for (i) smooth pipe and (ii) Rough Pipes. 15

UNIT – II

4. At a sudden enlargement of water main from 240 mm to 480 mm diameter, the hydraulic gradient rises by 10 mm. Estimate the rate of flow. 15

5. A horizontal pipe line 40 m long is connected to a water tank at one end and discharges 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. 15

UNIT – III

6. A concrete lined circular channel of diameter 3 m has a bed slope of 1 in 500. Work out the velocity and flow rate for the conditions of (i) maximum velocity and (ii) maximum discharge. Assume Chezy's C = 50. 15

7. Obtain an relationship between the Froude Numbers of flow before and after the hydraulic jump in horizontal rectangular channel. 15

UNIT – IV

8. Prove that the loss of energy head in a hydraulic jump is equal to $(d_2 - d_1)^3 / d_1 d_2$, where d_1 and d_2 are the conjugate depths. 15

9. A 300 mm diameter pipe carries water under a head of 20 meters with a velocity of 3.5 m/s. If the axis of the pipe turns through 45°, find the magnitude and direction of the resultant force at the bend. 15

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B. Tech. 4th Semester (Civil) Examination – May, 2023

DESIGN OF CONCRETE STRUCTURE

Paper : PCC-CE-204-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Questions No. 1 is ***compulsory***. All questions carry equal marks.

1. Describe the following : 15

(a) Slenderness ratio

(b) Assumption of limit state

(c) Water cement ratio

(d) Shrinkage and creep

(e) Factor affecting the strength of concrete

SECTION – A

2. (a) Explain the principles of concrete mix design. What are the various factors governing the selection of mix proportion according to Indian standard ? 7.5

   (b) Write the short note on the workability of concrete. 7.5

3. (a) Describe the stress strain relation of steel in detail. 7.5

   (b) Determine the moment of resistance of a singly reinforced 160 mm wide and 300 mm deep (effective) beam. The reinforcement consists of 4 bars of 16 mm diameter. The material used is M15 concrete and Fe 250 steel. Take m = 18. If the span of the beam is 5 m, find the maximum distributed load which the beam can carry, inclusive of its own weight. 7.5

SECTION – B

4. (a) Write a short note on steel beam theory. 7.5

   (b) A rectangular beam section is reinforced on both side is 300 mm wide and having 550 mm depth. The centre of steel on both side is 50 mm away

from respective edges. Determine the steel area on both side for a bending moment of 90 KN. Solve by working stress method. 7.5

5. Design a simply supported beam to carry a load of 14500 N/m. The clear span of beam is 5.5 m. The bearing on each end is 300 mm. Assume permissible nominal shear stress as 0.3 N/mm^2. Solve it by limit state. 15

SECTION – C

6. (a) What are requirements of a good detailing in RCC ? 7.5

   (b) Write a short note on spacing of reinforcement in slab. 7.5

7. Design a simply supported slab supported on masonry wall with following details : 15

   Clear span = 4 m

   live load = 3000 N/m^2

   modification factor = 1.4

   nominal shear stress = 0.3 N/mm^2.

SECTION – D

8. A square column 400 mm × 400 mm supports a total load of 1500 KN. Design the column and a square footing for this column. The safe bearing capacity of soil is 250 KNM/m^2. 15

9. Determined the reinforcement for a short column for the following data : 15

Column size : 450 mm × 650 mm

Pu = 2600 kN

Mux = 175 Kn

Muy = 135 KN

Use M20 Concrete mix and Fe 415 Steel

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B. Tech. 4th Semester (Civil) Examination – May, 2023

STRUCTURAL ANALYSIS

Paper : PCC-CE-206-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Describe the following : 15

(a) ILD for bending moment

(b) Kinematic indeterminacies

(c) Castigliano's 2nd theorem

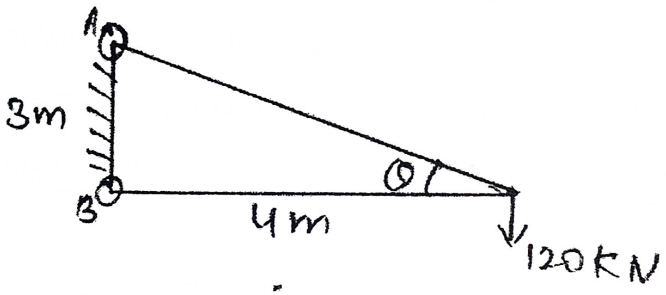
(d) Horizontal thrust three hinge arch

(e) Applications of anchor cable

SECTION – A

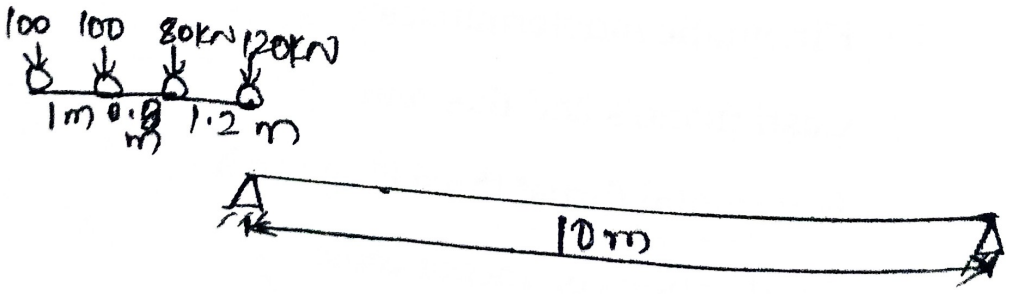
2. A beam ABCD is simply supported at A and D over a span of 10 m. The beam carries point loads 60 KN and 40 KN at a distance of 3 m and 6 m from the end A. Neglecting the weight of the beam find the slopes at A, B, C and D and the deflection at C and D. Take $I = 12 \times 10^8$ mm^4 and E = 200 KN/mm^2. 15

3. Find the vertical and horizontal deflection of joint C of truss shown in fig. The area of the inclined tie is 2000 mm^2 while the area of the horizontal member is 1600 mm^2. Take E = 210 KN/mm^2. 15

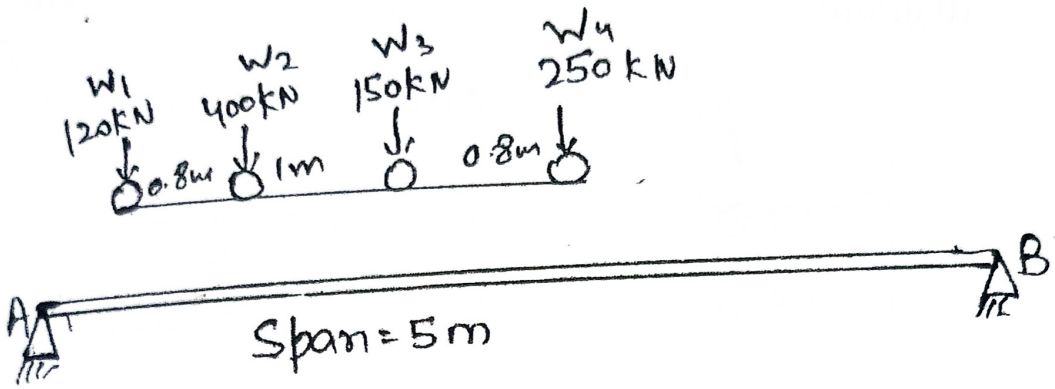


SECTION – B

4. The load system as shown in fig. moves from left to right on a girder of span 10 meters. Find the maximum bending moment which can occur under the 80 KN load. 15



5. The wheel load system shown in fig. can move a girder of span of 5 m. Find the maximum positive and negative force for the girder. 15



SECTION – C

6. A three hinged parabolic arch has a span of 40 m and rise of 7 m. It subjected to a uniformly distributed load of 80 KN acting at 10 m from the right support, find the 15

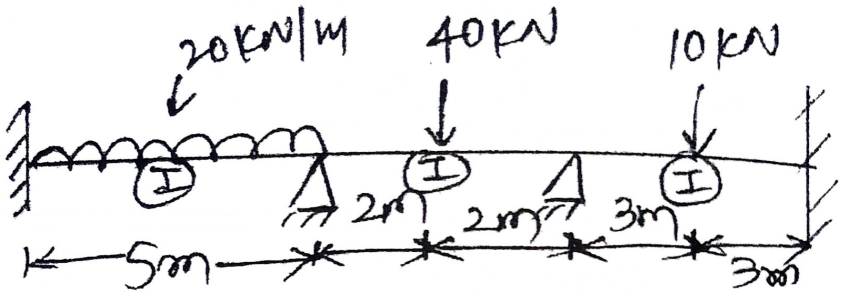
(i) Horizontal thrust and vertical reaction on supports

(ii) Normal thrust and radial shear

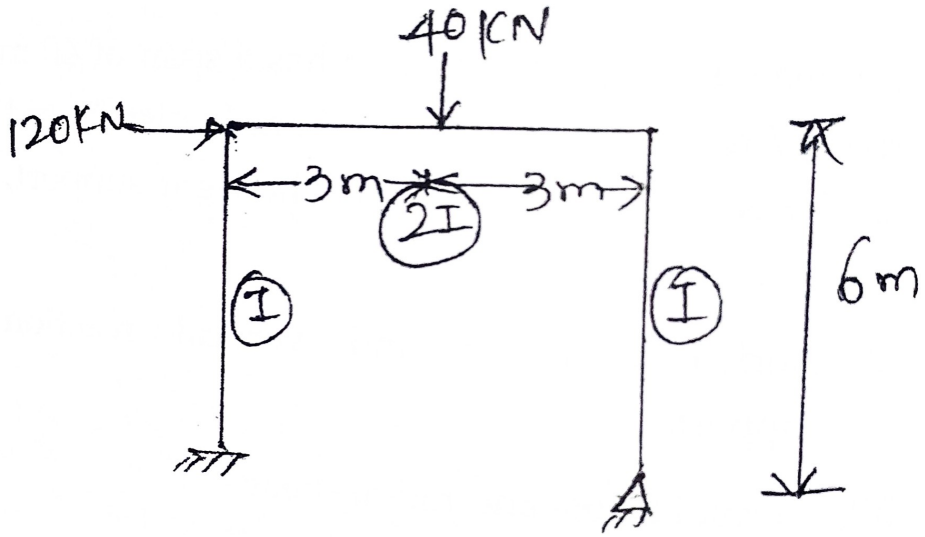
7. The three hinged stiffened girder of a suspension bridge of span 120 m is subjected to a two point loads of 240 KN and 300 KN at a distance of 25 m and 80 m from left end. Find the shear force and bending moment for the girder at a distance of 40 m from left end. The supporting cable has a central dip of 12 m. Find also the maximum tension in the cable. 15

SECTION – D

8. Analysis the following beam using slope and deflection method and draw its bending moment diagram. 15



9. Analysis the following frame using Kani's Method. 15



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B. Tech. 4th Semester (Civil) Examination – May, 2023

GEOMATICS & AERIAL SURVEYING

Paper : PCC-CE-208-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Describe the following : $2.5 \times 6 = 15$

   (a) Classification of triangulation system

   (b) Applications of total station

   (c) Equation of time

   (d) EMR characteristics

   (e) Crab and drift

   (f) Different GIS Software

P. T. O.

SECTION – A

2. (a) Describe the principle and methods of trilateration. Also explain the advantages and disadvantages of trilateration. 7

(b) Two triangulation stations A and B 100 km apart have elevations of 140 m and 406 m respectively. A point C, 60 km from A has an elevation of 150 m. Check the intervisibility of A and B and if required, determine the height of signal at B so that the line of sight clears by 3 m. 8

3. (a) What is the principle of least square ? Derive the relationship of least square. 7

(b) Adjust the angles A, B and C of a triangle ABC from the following data. Use method of correlates : 8

A = 86035'11.1" w = 2

B = 42015'17" w = 1

C = 51009'34" w = 3

SECTION – B

4. (a) Explain with suitable diagram. "Napier's rules of circular parts" to solve a right angled spherical triangle. 7

(b) The altitudes of a star at upper and lower transits are 72°40' and 25°30'. Both the transits are on the north side of zenith of the place. Find the latitude of the place of observation and declination of the star. 8

5. (a) Enumerate different time systems. Describe each in detail. 7

(b) Define the following terms with neat diagram : 8

(i) Azimuth

(ii) Hour Circle

(iii) Prime Vertical

(iv) Ecliptic circle

SECTION – C

6. (a) Derive an expression for Relief Displacement on a Vertical Photograph with neat diagram. 7

(b) What do you understand by Flight Planning for aerial photograph ? Also discuss different types of overlap. 8

7. (a) A vertical photograph was taken at an altitude of 1200 m above mean sea level. Determine the scale of photograph for terrain lying at elevations of 80 m and 300 m if the focal length of camera is 15 cm. 10

(b) Describe Stereoscopic vision and stereoscopes in detail. 5

SECTION – D

8. (a) Compare Raster and Vector model for representing geographic features. 7

(b) Describe in detail the different parameters required to locate a satellite in space. 8

9. (a) What is electromagnetic spectrum ? Describe with neat diagram. 6

(b) Write a short note on the following : 9

(i) Polarisation of EMR

(ii) Coherent radiation

(iii) Sources of EMR for remote sensing

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B. Tech. 4th Semester (Civil) Examination – May, 2023

MATERIAL TESTING AND EVALUATION

Paper : PCC-CE-210-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Describe the following : $3 \times 5 = 15$

(a) Ceramics and Refractories

(b) Mortal

(c) Creep

(d) Shrinkage of material

(e) Lime

SECTION – A

2. (a) Explain the Plain concrete and reinforced concrete in detail. 7.5

   (b) Explain the function of bitumen and asphalt in construction industry. 7.5

3. (a) Explain the different types of cement used along with their suitability. 7.5

   (b) Explain the proportion of lime and cement mortar used for masonry and plastering. 7.5

SECTION – B

4. (a) Explain the properties of fresh concrete. 7.5

   (b) Explain the freezing and thawing effect of concrete. 7.5

5. (a) Explain in detail British mix design method along with Indian Standard guidelines. 7.5

   (b) Explain ACI mix design method and USBR method for the design of concrete mix. 7.5

SECTION – C

6. (a) Explain the tensile test of steel used in laboratory. 7.5

   (b) Explain the strength of ceramics used in civil engineering. 7.5

7. (a) Explain the brittle failure of steel by the temperature transition approach. 7.5

(b) Explain the different types of steel used in civil engineering. 7.5

SECTION – D

8. Explain the fracture toughness of different material and procedure to determine the fracture toughness. 15

9. Explain the working of crusher and dozer in field. 15
