

# CBCS SCHEME

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18CV51

## Fifth Semester B.E. Degree Examination, July/August 2021 Construction Management and Entrepreneurship

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions.  
2. Assume the factors accordingly.

- 1 a. Explain in brief the types of plans based on various factors. (08 Marks)  
b. What are the characteristics of management? (08 Marks)  
c. What is Gantt chart? Explain with its significance. (04 Marks)
- 2 a. What is project organization? Explain with a typical project organization chart. (08 Marks)  
b. Differentiate between AOA and AON. (04 Marks)  
c. Draw the network from the following activity and find critical path and total project duration:

Activity	A	B	C	D	E	F	G
Predecessor	-	-	A	A	B	B	D, F
Duration days	10	9	9	8	7	11	5

(08 Marks)

- 3 a. Classify the construction equipments based on different functions. (08 Marks)  
b. Determine the output of a Bulldozer having 215 HP engine, fitted with '5' blade rated capacity  $4.4\text{m}^3$ . The dozer is employed for excavating a hard clayey soil with average ranking of 50mts with an ideal output of 160LCM (approx) on a downhill with slope 20%. It has direct drive transmission and its expected performance is 55 minutes per hour. Assume the correction factors accordingly. (08 Marks)  
c. Write a note on labour productivity rates and its measurement. (04 Marks)
- 4 a. Explain in brief the different types of constructing equipment maintenance methods. (08 Marks)  
b. A company has purchased a construction equipment for Rs.2,00,000/- with an estimated life of 5 years and its resale value after the estimated life is 10% of the cost of equipment. Determine the depreciation charge and book value at the end of each year. Also calculate the hourly depreciation if the equipment is planned to operated 1500 hours per year. (08 Marks)  
c. Explain in brief the inventory control techniques used in material management. (04 Marks)
- 5 a. Explain the dimensions of quality in a construction project. (08 Marks)  
b. Explain the significance of TQM in the project. (08 Marks)  
c. List out the benefits of ethics at work place. (04 Marks)
- 6 a. Explain the different types of conflict of interest. (08 Marks)  
b. Explain the safety procedure to be adopted during demolition of RCC structure. (08 Marks)  
c. Write a note on ISO standards for construction process. (04 Marks)

- 7 a. Explain the benefit of engineering economy in construction management. (08 Marks)  
 b. A firm invest in one of the two mutually exclusive alternative. Determine the best alternative based on annual equivalent method with the given details. (12 Marks)

$$i = 20\%$$

Alternative	Investment (Rs)	Annual equal return (Rs)	Salvage value (Rs)
A	2,50,000	90,000	20,000
B	2,75,000	1,00,000	50,000

- 8 a. Differentiate between Micro and Macro economics. (08 Marks)  
 b. Determine the effective interest rate for a nominal rate of 6 percent that is compounded  
 i) Daily ii) Monthly iii) Quarterly iv) Half yearly v) Annually. (12 Marks)
- 9 a. Explain the stages of entrepreneurial process. (08 Marks)  
 b. What is MSME? Explain its significance. (04 Marks)  
 c. Explain the role and scope of i) TECSOK ii) SIDBI. (08 Marks)
- 10 a. Explain the business planning process. (08 Marks)  
 b. Mention the mode of non-equity arrangement for international entrepreneurial entry with its benefit. (04 Marks)  
 c. Explain the concept of feasibility study and its report for starting a project. (08 Marks)

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# CBCS SCHEME

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18CV52

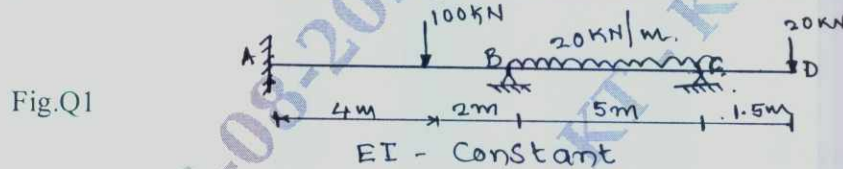
## Fifth Semester B.E. Degree Examination, July/August 2021 Analysis of Indeterminate Structure

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions.*

- 1 Analyze continuous beam ABCD by slope deflection method. Construct SFD and BMD.



(20 Marks)

- 2 Analyze the frame shown in Fig.Q2 by slope deflection method and draw BMD.



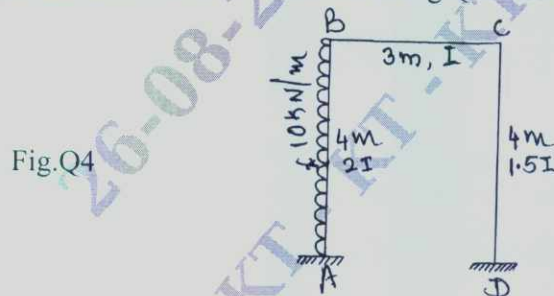
(20 Marks)

- 3 Analyze the continuous beam ABCD loaded as shown in Fig.Q3 if settlement in support B and C are 5 mm and 10 mm respectively. Use moment distribution method. Take  $EI = 2.7 \times 10^5 \text{ kN-m}^2$ . Draw BMD.



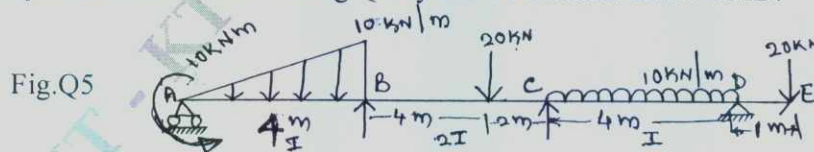
(20 Marks)

- 4 Analyze the frame loaded as shown in Fig.Q4. Use moment distribution method.



(20 Marks)

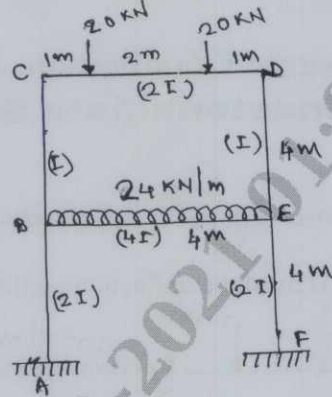
- 5 Analyze the beam shown in Fig.Q5 by Kani's method. Draw BMD.



(20 Marks)

- 6 Analyze the frame shown in Fig.Q6 by Kani's method. (Make use of symmetry)

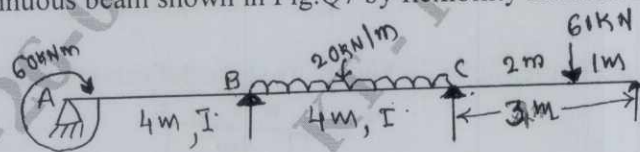
Fig.Q6



(20 Marks)

- 7 Analyze the continuous beam shown in Fig.Q7 by flexibility method. Draw BMD.

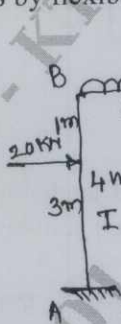
Fig.Q7



(20 Marks)

- 8 Analyze frame shown in Fig.Q8 by flexibility matrix approach. Draw BMD.

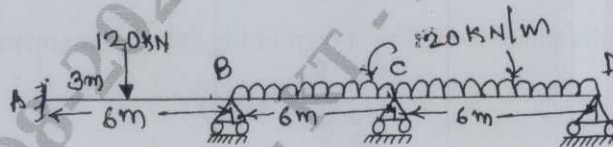
Fig.Q8



(20 Marks)

- 9 Analyze the continuous beam shown in Fig.Q9 by stiffness matrix method. Take EI constant.

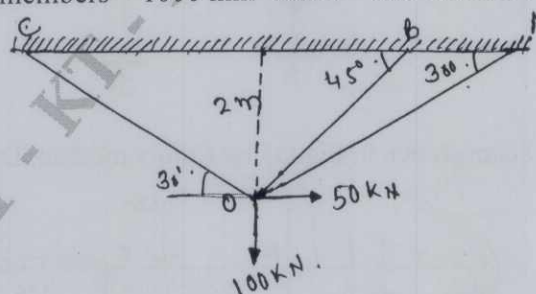
Fig.Q9



(20 Marks)

- 10 Analyze the pin-jointed truss shown in Fig.Q10 by stiffness matrix method. Take cross-sectional area for all members = 1000 mm<sup>2</sup> and E = 200 kN/mm<sup>2</sup>.

Fig.Q10



(20 Marks)

# CBCS SCHEME

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18CV53

Fifth Semester B.E. Degree Examination, July/August 2021

## Design of RC Structural Elements

Time: 3 hrs.

Max. Marks: 100

- Note : 1. Answer any FIVE full questions.  
2. Use of IS : 456 – 2000 , SP16 is permitted.  
3. Assume suitable data, if necessary.

- 1 a. Explain the principles of limit state design. (06 Marks)  
b. Explain briefly under reinforced, over reinforced and balanced section with sketch. (06 Marks)  
c. A simply supported beam of rectangular section spanning 6m has a width of 300mm and overall depth of 600mm. The beam is reinforced with tensile steel of area  $1963\text{mm}^2$  with an effective cover of 50mm. Diameter of bars is 25mm spaced at 50mm centers. The beam is subjected to a moment of 160kN-m at centre of span. Check the beam for serviceability limit state of cracking. Assume  $f_{ck} = 25\text{ N/mm}^2$  and  $f_y = 415\text{ N/mm}^2$ . (08 Marks)
- 2 a. Write a brief note on :  
i) Partial safety factors for materials.  
ii) Characteristic loads.  
iii) Characteristic strength.  
iv) Partial safety factors for loads. (12 Marks)  
b. A simply supported beam of rectangular section spans over 10m and has an effective depth of 700mm. The beam is reinforced with 1% reinforcement on the tension side. Check for the deflection control of the beam by empirical method if :  
i) Fe415 HYSD bars are used      ii) Fe500 HYSD bars are used. (08 Marks)
- 3 a. Derive from fundamentals the expression for the area of stress block  $0.36 f_{ck} X_u$ . (08 Marks)  
b. Determine the moment of resistance of T – beam for the following data :  
Width of the flange = 2500mm , Effective depth = 800mm , Width of Web = 300mm ,  
Depth of flange = 150mm , Number of bars = 8 of 25mm diameter. Assume  $M_{20}$  concrete and Fe415 steel. (12 Marks)
- 4 a. Derive the moment of resistance equation for doubly reinforced rectangular section. (10 Marks)  
b. A singly reinforced concrete beam of 250mm × 450mm deep upto the centre of reinforcement with 3 bars of 16mm diameter at an effective cover of 50mm, effective span of 6m. Use  $M_{20}$  concrete and Fe415 steel. Determine the central point load that can be supported in addition to the self weight. (10 Marks)
- 5 A reinforced concrete beam is to be designed over an effective span of 5m to support a design service load of 8 kN/m. Adopt  $M_{20}$  grade concrete and Fe415 HYSD bars and design the beam to satisfy the collapse and serviceability limit states. (20 Marks)
- 6 A T – beam slab floor of an office building comprises of a slab 150mm thick spanning between ribs spaced at 3m centres. The effective span of the beam is 8m. LL on the floor is  $4\text{ kN/m}^2$ . Using  $M_{20}$  concrete and Fe415 steel, design one of the intermediate T – beams. (20 Marks)

- 7 Design a RCC slab for an office floor  $4.5\text{m} \times 5.5\text{m}$  with four edges discontinuous and corners held down. The LL on the slab is  $3\text{kN/m}^2$ . Assume floor finish as  $0.6\text{kN/m}^2$  and ceiling finish as  $0.4\text{kN/m}^2$ . Use  $M_{20}$  grade concrete and Fe415 steel. Sketch the reinforcement. (20 Marks)
- 8 a. Distinguish between one way slab and two way slab. (04 Marks)  
b. Design a Dog legged stair for an office building in a room measuring  $2.8\text{m} \times 5.8\text{m}$ , clear distance between floors is  $3.6\text{m}$ . The width of the flight is to be  $1.25\text{m}$ . Assume Live load of  $3\text{kN/m}^2$ . Use  $M_{20}$  grade concrete and Fe415 steel. Assume that the stair supported on  $230\text{mm}$  at the outer edge of landing stairs. Sketch the reinforcement details. (16 Marks)
- 9 a. What is the role of transverse reinforcement in columns? What are the codal provisions to design transverse reinforcement? (06 Marks)  
b. Explain the difference between Short columns and Long columns. (04 Marks)  
c. A column size  $300\text{mm} \times 400\text{mm}$  has an effective length of  $3.6\text{m}$  and is subjected to  $P_u = 1100\text{kN}$  and  $M_u = 150\text{ kN m}$  about the major axis. Assuming the bars on two sides. Design the column using  $M_{25}$  concrete and Fe415 steel. (10 Marks)
- 10 Design an isolated footing for a rectangular column of  $300\text{mm} \times 500\text{mm}$  supporting an axial load of  $1500\text{ kN}$  factored. Assume SBC of soil as  $185\text{ kN/m}^2$ . Use  $M_{20}$  grade concrete and Fe415 steel. Sketch the reinforcement and perform the necessary checks. (20 Marks)

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# CBCS SCHEME

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18CV54

## Fifth Semester B.E. Degree Examination, July/August 2021 Basic Geotechnical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. With the help of 3 – phase diagram, define Void ratio, Porosity, Water content and Degree of saturation. (08 Marks)
- b. The mass of wet soil when compacted in a mould was 19.17N. The water content of the soil mass was 16%. If the volume of mould was 0.945 litres, determine  
i) Dry density ii) Void ratio iii) Degree of saturation iv) Percent air voids.  
Take  $G = 2.68$ . (12 Marks)

- 2 a. Define Liquid limit, Plastic limit and Shrinkage limit ; Liquidity index and Relative consistency. (06 Marks)
- b. Explain determination of In-situ density of soil by Sand replacement method. (08 Marks)
- c. The liquid limit test on soil sample gives the following results. The plastic limit of the soil is 40%.

No. of Blows	12	18	22	34
Water content %	56	52	50	45

- Plot a flow curve and obtain i) Liquid limit ii) Flow Index iii) Plasticity Index and iv) Toughness Index. (06 Marks)
- 3 a. List and explain various soil structures. (06 Marks)
- b. Briefly explain the factors affecting compaction. (06 Marks)
- c. A standard proctor test was performed on a soil sample of specific gravity 2.70, with the following results :  
Maximum dry unit weight =  $18 \text{ kN/m}^3$  ; Optimum moisture content = 16%.  
If the compaction effect was increased so that the maximum unit weight is  $19.2 \text{ kN/m}^3$ , assuming same degree of saturation, what should be the corresponding OMC. (08 Marks)
- 4 a. Explain Common clay minerals with sketches. (06 Marks)
- b. Explain Electrical diffuse double layer and adsorbed water. (06 Marks)
- c. A soil in the borrowpit is at a dry density of  $16.67 \text{ kN/m}^3$  with water content of 12%. If the soil of  $2000 \text{ m}^3$  is excavated from it and compacted in an embankment with porosity of 0.32, calculate the volume of embankment which can be constructed out of this material.  
Take  $G = 2.70$ . (08 Marks)
- 5 a. Explain the following : i) Effective stress analysis ii) Seepage analysis. (06 Marks)
- b. With the help of a neat sketch, derive the equation to determine permeability by Falling Head Permeability Test. (06 Marks)
- c. Calculate the seepage through an earth dam resting on an impervious foundation. The relevant data are given below :  
Height of Dam = 60.0m ; Free Board = 2.5m ; Upstream slope = 2.75 : 1 ;  
Crest width = 8.0m ; Downstream slope = 2.50 : 1 ; Length of drainage blanket = 120.0m.  
Coefficient of permeability of the embankment material in x – direction =  $8 \times 10^{-7} \text{ m/s}$  ;  
y – direction =  $2 \times 10^{-7} \text{ m/s}$ . (08 Marks)

- 6 a. What is a Flownet? What are the characteristics and uses of the Flownet? (06 Marks)  
 b. Describe the Casagrande's method to locate the phreatic line in a homogeneous earth dam with a horizontal filter @ its toe. (06 Marks)  
 c. A soil sample of height 60mm with cross sectional area  $8000\text{mm}^2$  was subjected to a falling head permeability test. In a time interval of 6 minutes, the head dropped from 750mm to 300mm. If the cross sectional area of stand pipe is  $150\text{mm}^2$ , compute the coefficient of permeability. If the same sample is subjected to a constant head of 200mm, compute the total quantity of water that will get discharged through the sample in a time interval of 10 minutes. (08 Marks)
- 7 a. Explain Mohr – Coulomb failure theory of soil. (06 Marks)  
 b. List the different methods to measure the shear strength of soil. Explain any one of them. (06 Marks)  
 c. A shear test was carried out and the following results are recorded :
- |                                   |     |     |
|-----------------------------------|-----|-----|
| Normal stress ( $\text{kN/m}^2$ ) | 200 | 250 |
| Shear stress ( $\text{kN/m}^2$ )  | 100 | 125 |
- Find shear parameters, what would be the deviator stress at failure if a biaxial test is carried out from the same soil with cell pressure of  $100\text{kN/m}^2$ . (08 Marks)
- 8 a. Explain the advantages of Triaxial shear test over Direct shear test. (06 Marks)  
 b. What are the factors affecting the shear strength of soil? (06 Marks)  
 c. A cylindrical specimen of saturated clay 40mm in diameter and 80mm in length is tested in an unconfined compression test. Find shear strength of clay, if the specimen fails under an axial load of 350N. The change in length of the specimen @ failure is 8mm. Also find the shear parameters if the angle made by the failure plane with horizontal is  $50^\circ$ . (08 Marks)
- 9 a. Enumerate the assumptions and limitations of Terzaghi's Consolidation theory. (06 Marks)  
 b. Briefly explain normally consolidated, under consolidated and over consolidated soils. (06 Marks)  
 c. A soil sample 20mm thick takes 20 minutes to reach 20% consolidation. Find the time taken for a clay layer 6m thick to reach 40% consolidation. Assume double drainage in both cases. (08 Marks)
- 10 a. Explain Mass – Spring Analogy. (06 Marks)  
 b. Explain determination of coefficient of consolidation by square root of Time Fitting method. (06 Marks)  
 c. In a consolidation test, the void ratio of soil sample decreases from 1.20 to 1.10. When the pressure increased from  $200\text{kN/m}^2$  to  $400\text{kN/m}^2$ . Calculate the coefficient of consolidation if the coefficient of permeability is  $8 \times 10^{-7} \text{ mm/s}$ . (08 Marks)

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# CBCS SCHEME

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18CV55

## Fifth Semester B.E. Degree Examination, July/August 2021 Municipal Waste Water Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain the need for sanitation along with different types of Sewerage systems. (10 Marks)  
b. Explain the factors affecting dry weather flow and the effects of flow variations in the design of sewerage system. (10 Marks)
- 2 a. Explain the different methods of domestic waste water disposal along with advantages and disadvantages. (10 Marks)  
b. A city has a projected population of 50,000 residing over an area of 40 hectares. Find the design discharge for the sewer line for the following data :  
i) Rate of water supply = 200  $\ell$ pcd  
ii) Time of concentration = 50 minutes.  
iii) Average impermeability coefficient for the entire area = 0.3.  
The sewer line is to be designed for a flow equivalent to the wet weather flow plus twice the dry weather flow. Use U.S ministry of health formula. Assume that 75% of water supply reaches in sewer as waste water. (10 Marks)
- 3 a. Draw a neat flow diagram and explain the Municipal Waste water treatment unit operations and process. (10 Marks)  
b. A 40cm diameter sewer is to flow at 0.4 depth on a grade ensuring a degree of self cleansing equivalent to that obtained at full depth at a velocity of 80cm/sec. Find  
i) The required grade.  
ii) Associated velocity.  
iii) Rate of discharge at this depth.  
Given : i) Manning's rugosity coefficient = 0.014  
ii) Proportionate area = 0.252 iii) Proportionate HMD ( $r/R$ ) = 0.684. (10 Marks)
- 4 a. What are the aims and objectives of Sampling technique involved in the waste water analysis? (04 Marks)  
b. Define the terms :  
i) Self Cleansing Velocity ii) Turbidity iii) BOD. (06 Marks)  
c. BOD of sewage incubated for one day at 30 °C has been found to be 100mg/ $\ell$ . What will be the 5 day 20 °C BOD? Assume  $K = 0.12$  [Base 10] at 20 °C. (10 Marks)
- 5 a. Explain the importance of screens and types of screens in the Sewage treatment process. (10 Marks)  
b. Write a note on Necessity of Sedimentation tanks. Explain the types along with a neat sketch of rectangular settling tank. (10 Marks)
- 6 a. Discuss in detail the process of Deoxygenation and Reoxygenation with respect to self purification of Natural water, with a neat sketch. (10 Marks)

- b. The domestic sewage of a town is to be discharged into a stream after treatment. Determine the maximum permissible effluent BOD and the percentage purification required in the treatment plant given the following particulars :
- Population of town = 50,000 ; D.W.F of sewage = 150 lpcd  
BOD contribution per capita = 0.075 kg/day ;  
Minimum flow of stream =  $0.20\text{m}^3/\text{sec}$  ; BOD of stream =  $3\text{mg}/\ell$  ;  
Maximum BOD of stream on downstream =  $5\text{mg}/\ell$ . (10 Marks)
- 7 a. Explain the working of a conventional Activated Sludge Process (ASP) with flow diagram. (10 Marks)  
b. Design a primary settling tank of rectangular shape for a town having a population of 50,000 with a water supply of 180 lpcd. Assume detention period = 2 hrs , Length = 4 times the breadth , Depth = Between 2.4 to 3.6m , Average over flow rate =  $30\text{m}^3/\text{d}/\text{m}^2$  , Breadth = Not more than 7.5m. (10 Marks)
- 8 a. Explain the Constructional details of a Conventional trickling filter, with a neat sketch. (10 Marks)  
b. Design a low rate filter to treat 6MLD of sewage of BOD  $210\text{mg}/\ell$ . The final effluent should be  $30\text{mg}/\ell$  and organic loading rate is  $320\text{g}/\text{m}^3/\text{d}$ . (10 Marks)
- 9 a. Discuss in brief the Biological and Chemical methods of removal of Phosphorous from waste water. (10 Marks)  
b. Draw a neat sketch of a septic tank with soak pit and write the design criteria required for septic tank. (10 Marks)
- 10 a. Write a note on two Pit latrines and Eco toilet. (10 Marks)  
b. Define Advanced Wastewater Treatment (AWT). What are its objectives? How do you select the AWT process for removal of contaminants? (10 Marks)

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# CBCS SCHEME

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18CV56

## Fifth Semester B.E. Degree Examination, July/August 2021 Highway Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Discuss the Socio-economic impact of improving transport infrastructures. (04 Marks)  
b. What are the recommendations of Jayakar Committee and how they are implemented? (08 Marks)  
c. Explain the saturation system for finding the optimum road length. (08 Marks)
- 2 a. Determine the length of different categories of road by the year 2001, using third road development formula by using the following data. Assume missing data suitably,  
Total area of the state = 80,000 sq.km  
Total number of towns as per 1981 census = 86. (04 Marks)  
b. What are the salient features of the following programme / schemes:  
(i) NHDP (ii) PMGSY. (08 Marks)  
c. What are the data/details collected in Reconnaissance and preliminary survey of highway alignment. (08 Marks)
- 3 a. Write a neat sketch of Highway in,  
(i) Embankment (ii) Cutting and label various components. (04 Marks)  
b. Calculate the Head Light Distance (HSD) and Intermediate Sight Distance (ISD) from the following data:  
Design speed = 80 kmph, Coefficient of friction = 0.35, Reaction time = 2.5 sec. (08 Marks)  
c. Design the rate of super elevation for horizontal curve of a highway of radius 500 m and speed 100 kmph. (08 Marks)
- 4 a. Write a short note on different types of gradients of a highway. (04 Marks)  
b. Design the length of transition curve from the following data:  
Ruling design speed  $V = 80$  kmph, Normal pavement width = 7.0 m, Rate of introduction of super elevation = 1 in 150, Pavement is rotated about inner edge. Assume two lane road and wheel base as 6.0 m. (08 Marks)  
c. Design the length of valley curve from the following data to fulfill comfort conditions and HSD:  
(i) A descending grade of 1 in 25 meets ascending of 1 in 30.  
(ii) Design speed of 80 kmph  
(iii) Assume  $C = 0.6 \text{ m/sec}^3$   
(iv) Assume  $t = 2.5 \text{ sec}$ ,  $f = 0.35$  (08 Marks)
- 5 a. List the desirable properties of soil used as a highway material. (04 Marks)  
b. A plate load test was conducted on soaked subgrade during the monsoon season using a plate diameter of 30 cm. Determine the modulus of subgrade reaction for the standard plate using the following data: (08 Marks)

Mean settlement values, mm	0	0.24	0.52	0.76	1.02	1.23	1.53	1.76
Load values, kg	0	460	900	1180	1360	1480	1590	1640

  
c. Mention any four tests conducted on (i) Aggregates (coarse) (ii) Bitumen  
Also mention the standard values / range of each test. (08 Marks)

- 6 a. Differentiate between Bitumen and Tar. (04 Marks)  
b. With the help of a neat sketch, explain the different component parts of a flexible pavement. Also mention their functions. (08 Marks)  
c. Explain the concept of ESWL with the help of a neat sketch. (08 Marks)
- 7 a. Explain the method of soil aggregate blending by Rothfutch's method. (10 Marks)  
b. Explain the step by step procedure of construction of Granular Sub Base (GSB) layer of pavement by mentioning physical properties of aggregate, gradation requirement (either for G-II or G-III) and quality control test for the layer. (10 Marks)
- 8 a. Explain the step by step procedure of construction of Bituminous Macadam (BM) layer of pavement by mentioning physical properties of aggregate, Gradation requirement (for G-II) and quality control test for the layer. (10 Marks)  
b. Explain the step by step procedure of construction of Dry Lean Concrete (DLC) of a rigid pavement by mentioning physical properties of aggregates. Gradation requirement and Quality control tests for the layer. (10 Marks)
- 9 a. List the requirements and importance of Highway drainage. (06 Marks)  
b. Explain with the help of a neat sketch:  
(i) Lowering the high water table in permissible soil strata. (07 Marks)  
(ii) Control of seepage flow in Highway drainage. (07 Marks)  
c. The maximum quantity of water expected in one of the open longitudinal drain on a clayey soil is  $0.9 \text{ m}^3/\text{sec}$ . Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of trapezoidal section to be 1.0 m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in drain is 1.2 m/sec and Mannings roughness coefficient is 0.02. (07 Marks)
- 10 a. Write a note on:  
(i) Motor Vehicle operation cost. (06 Marks)  
(ii) Annual Highway cost. (06 Marks)  
b. Write a note on:  
(i) Rate of return method. (07 Marks)  
(ii) Benefit-cost ratio method of economic analysis of highway project. (07 Marks)  
c. Write a note on:  
(i) BOT and BOOT (07 Marks)  
(ii) Sources of Revenue for highway development and maintenances (07 Marks)

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# CBCS SCHEME

18CIV59

USN

AKT19CS404

Fifth Semester B.E Degree Examination, July/August 2021

## Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 100

### INSTRUCTIONS TO THE CANDIDATES

1. Answer all the hundred questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

- 
1. The term ecosystem was proposed by  
a) A.G. Tansley  
b) Marrie Gibbs  
c) Costanza  
d) Jacob Van Verkul
  2. World environment day is on  
a) 5<sup>th</sup> May  
b) 5<sup>th</sup> June  
c) 18<sup>th</sup> July  
d) 16<sup>th</sup> August
  3. Atmosphere consists of 79% Nitrogen and 21% oxygen by  
a) volume  
b) weight  
c) density  
d) all the three
  4. Which of the following is a biotic component of an ecosystem?  
a) Fungi  
b) sunlight  
c) temperature  
d) humidity
  5. Which pyramid is always upright  
a) Biomass  
b) Energy  
c) Food chain  
d) Temperature
  6. The largest reservoir of nitrogen in our planet is  
a) Oceans  
b) Biosphere  
c) Atmosphere  
d) Fossil fuels
  7. In aquatic ecosystem phytoplankton can be considered as a  
a) Consumer  
b) Macro consumer  
c) Producer  
d) Decomposer
  8. The basic requirements of human beings are provided by  
a) agriculture  
b) nature  
c) urbanization  
d) industries
  9. Environment is the life support system that includes  
a) air  
b) water  
c) land  
d) all the above

10. In an ecosystem biological cycling of materials is maintained by  
 a) producer                      b) consumer                      c) decomposer                      d) all the above
11. The primary producer in a forest ecosystem are  
 a) Chlorophyll containing plants and trees  
 b) Carnivores  
 c) Herbivores  
 d) Bacteria and other micro organisms.
12. Primary consumers are  
 a) herbivores                      b) carnivores  
 c) omnivores                      d) macro-consumers
13. Access to food is mainly determined by  
 a) human resources                      b) household income  
 c) food assistance programs                      d) society/community
14. Which of the following is a climatic factor?  
 a) pressure                      b) temperature                      c) humidity                      d) all the above
15. The major atmosphere gas layer is stratosphere is  
 a) hydrogen                      b) carbon dioxide                      c) ozone                      d) helium
16. Which atmospheric sphere is close to the earth surface?  
 a) troposphere                      b) mesosphere                      c) stratosphere                      d) exosphere
17. Which following gas is absorbed by grew plants from the atmosphere?  
 a) water vapour                      b) carbon dioxide                      c) hydrogen                      d) nitrogen
18. Most stable ecosystem is  
 a) forest                      b) desert                      c) river                      d) ocean
19. Tropical forests occur is India in  
 a) Karnataka                      b) Kerala and Assam                      c) Maharashtra                      d) West Bengal
20. The short term properties of the atmosphere at a given place and time is referred as  
 a) climate                      b) microclimate                      c) weather                      d) humidity
21. The green plants are also called as  
 a) autotrophs                      b) producers                      c) converters                      d) all the above
22. The percentage of sunlight used by the plants its photosynthesis is about  
 a) 0.2%                      b) 2.0%                      c) 0.02%                      d) 20.0%
23. Driving force in an ecosystem is  
 a) plants                      b) producers                      c) solar energy                      d) biomass energy
24. Environment means  
 a) air and water                      b) a beautiful landscape  
 c) soil and water                      d) sum total of all condition

25. Lithosphere consists of  
 a) air                      b) water                      c) rocks and soil                      d) all the above
26. Most of the biotic resources are  
 a) non-renewable                      b) renewable                      c) Thum                      d) none of these
27. The first international earth summit was held of  
 a) Rio-de Janeiro                      b) Kyoto                      c) Stockholm                      d) Paris
28. Economic and social security is required against  
 a) unemployment                      b) illness                      c) old age                      d) all the above
29. The thickness of the earth's crust is  
 a) between 5 to 70km                      b) 200 km                      c) 500 km                      d) 1000 km
30. The desert among the following is not a cold desert  
 a) Gobi desert                      b) Atacama desert                      c) Mojave desert                      d) Patagonian desert
31. Sundarban delta is present in which state?  
 a) Karnataka                      b) West Bengal                      c) Kerala                      d) Tamil Nadu
32. Mining means  
 a) to conserve minerals                      b) to check pollution                      c) to extract minerals and ores                      d) none
33. EIA can be expanded as  
 a) Environment and Industrial Act  
 b) Environment and Impact Activities  
 c) Environmental Impact Assessment  
 d) Environmental Impact Activity
34. In order to protect the health of people living along the adjoining areas of roads on should  
 a) plant trees alongside of the roads                      b) not allow diesel driven vehicles  
 c) shift the people to other places                      d) none of the above
35. The pollution caused by transportation depends on  
 a) type of the vehicles engine                      b) age of the vehicle  
 c) traffic congestion                      d) all the above
36. Which of the following is a key element of EIA?  
 a) scoping                      b) screening  
 c) identifying and evaluating alternatives                      d) all the above
37. Earth day is held every year on  
 a) April 22<sup>nd</sup>                      b) 5<sup>th</sup> June                      c) November 23<sup>rd</sup>                      d) January 26<sup>th</sup>
38. Major purpose of most of the dams around the world is  
 a) power generation                      b) flood control  
 c) irrigation                      d) drinking water supply

39. The adverse effect of modern agriculture is  
a) water pollution  
b) soil degradation  
c) water logging  
d) all the above
40. Which of the following is the most environment friendly agricultural practice?  
a) organic farming  
b) using chemical fertilizers  
c) use of insecticides  
d) none of the above
41. Farmers have a tendency to  
a) use optimum quantity of water  
b) over irrigate their crops  
c) to conserve water  
d) none of the above
42. Water logging is a phenomenon in which  
a) crop patterns are rotated  
b) soil root zone becomes saturated due to over irrigation  
c) erosion of soil  
d) none of the above
43. How we can protect our environment?  
a) plant trees  
b) control pollution  
c) stop deforestation  
d) all of the above
44. Organic farming is  
a) farming without pesticides and chemical fertilizers  
b) promotes soil biological activity  
c) enhances biodiversity  
d) all of the above
45. Impact of mining on environment  
a) brings order into social setup  
b) devastation of Eco system  
c) mineral extraction has no effect on Eco system  
d) sustainable development
46. Soil conservation is a process in which  
a) soil erosion is allowed  
b) soil is aerated  
c) sterile soil is made fertile  
d) soil is protected against loss
47. Soil Erosion can be prevented by  
a) over grazing  
b) deforestation  
c) afforestation  
d) removal of vegetation.



48. Bio-remediation means the removal of contaminants from  
a) water released from industries  
b) soil and ground water  
c) soil  
d) none of the above
49. Terrace farming is practiced in  
a) hilly areas                      b) deserts                      c) coastal areas                      d) plains
50. Effect of modern agriculture on soil is due to  
a) erosion                      b) acidification                      c) salinization                      d) all the above
51. Over grazing results in  
a) soil erosion                      b) productive soil  
c) increase of soil nutrients                      d) all of the above
52. Molasses from sugar industry is used to generate  
a) bio diesel                      b) hydrogen gas                      c) bioethanol                      d) biomethanol
53. Cholera and typhoid are caused by  
a) virus                      b) housefly                      c) fungus                      d) bacteria
54. Which of the following is most environmental friendly agriculture practice?  
a) using chemical fertilizer  
b) use of bio-compost materials  
c) using alluvial soil  
d) without pesticides and chemical fertilizers
55. Decreased soil fertility through rapid leaching of the essential mineral nutrients is due to  
a) reforestation                      b) deforestation  
c) over-exploitation                      d) none of the above
56. Which of the following are major environmental issues in mining activities?  
a) air pollution                      b) water pollution                      c) soil degradation                      d) all of these
57. About 71% of the earth surface is covered by  
a) land                      b) vegetation  
c) water                      d) none of the above
58. Blue baby syndrome is caused by the contamination of water due to  
a) Nitrates                      b) Arsenic                      c) phosphates                      d) sulphur
59. What is the permissible range of pH for drinking water as per the Indian standards?  
a) 6 to 9                      b) 6.5 to 7.5                      c) 6.5 to 8.5                      d) 6 to 8.5
60. What is the maximum allowable concentration of fluorides in drinking water?  
a) 1.0mg/litre                      b) 1.25 mg/litre                      c) 1.50 mg/litre                      d) 1.75 mg/litre
61. The depletion of trees is causing accumulation of  
a)  $\text{NO}_2$                       b)  $\text{SO}_2$                       c)  $\text{O}_2$                       d)  $\text{CO}_2$

62. Earth's atmosphere contains how much percentage of nitrogen?  
a) 98%                      b) 21%                      c) 78%                      d) 12%
63. India has the largest share of which of the following?  
a) manganese              b) mica                      c) copper                      d) bauxite
64. Conversion of Ammonia to  $\text{NO}_3$  by chemical oxidation is termed as  
a) nitrification              b) leaching                      c) denitrification              d) mineralization
65. Forest rich area in Karnataka is found in  
a) Western Ghats area                      b) Bandipur area  
c) Nagarahole area                      d) Sandur area
66. Mineral resources are  
a) renewable                      b) available in plenty  
c) non-renewable                      d) equally distributed
67. The groundwater depends on  
a) amount of rainfall                      b) runoff  
c) geological formations                      d) all the above
68. Physical pollution of water is due to  
a) dissolved oxygen                      b) turbidity  
c) total solids                      d) BOD
69. Nitrogen fixing bacteria exists in \_\_\_\_\_ of plants  
a) leaf                      b) stem                      c) roots                      d) flower
70. Which of the following is considered as an alternative fuel?  
a) CNG                      b) Kerosene                      c) coal                      d) petrol
71. Solar radiation consists of  
a) UV                      b) visible light                      c) infrared                      d) all of these
72. Biogas is produced by  
a) microbial activity  
b) harvesting of crops  
c) soil fertility  
d) none of these
73. Chernobyl nuclear disaster occurred in the year  
a) 1986                      b) 1984                      c) 1952                      d) 1987
74. The expansion for OTEC  
a) Ocean Thermal Energy Conversion  
b) Ocean Tidal Energy Conversion  
c) Ocean Tidal Energy Composition  
d) none of these
75. Wind mill farm is existing \_\_\_\_\_ district of Karnataka.  
a) Chitradurga                      b) Ballari                      c) Raichur                      d) Hassan

76. Wind energy generation depends on  
 a) direction of the wind  
 b) humidity  
 c) velocity of wind  
 d) precipitation
77. Which of the following source of energy is less eco friendly?  
 a) biogas  
 b) wind  
 c) solar  
 d) nuclear
78. Silver Iodide is used in  
 a) cloud seeding  
 b) nitrification  
 c) afforestation  
 d) decomposition
79. Nuclear power plant in Karnataka is located at  
 a) Bhadravathi  
 b) Sandur  
 c) Kaiga  
 d) Raichur
80. Cow dung can be used  
 a) as manure  
 b) as fuel  
 c) for production of biogas  
 d) all the above
81. Natural gas contains  
 a) carbon dioxide  
 b) hydrogen  
 c) methane  
 d) nitrogen
82. LPG(gas) is a mixture of  
 a)  $N_2$  and  $H_2S$   
 b)  $CO_2$  and  $NO_2$   
 c) Propane and Butane  
 d) Methane and Ethane
83. The source of electromagnetic radiation is  
 a) sun  
 b) wind  
 c) tide  
 d) water
84. An important NGO involved in global environmental protection is  
 a) UNICEF  
 b) green peace  
 c) BAIF  
 d) CPCB
85. ISO : 14000 standards deal with  
 a) Pollution Management  
 b) Risk Management  
 c) Environmental Management  
 d) none of these
86. Which state is having highest women literary rate in India?  
 a) Maharashtra  
 b) Kerala  
 c) Rajasthan  
 d) Karnataka
87. Which of the following animal is endangered species of India?  
 a) Black buck  
 b) Elephant  
 c) Giraffe  
 d) Lion
88. The leader of Chipko movement is  
 a) Medha Patkar  
 b) Sundarlal Bahuguna  
 c) Suresh Hablikar  
 d) Vandana Shiva
89. The Tiger Conservation Project was started it's the year  
 a) 1984  
 b) 1972  
 c) 1999  
 d) 2004
90. LANDSAT is a  
 a) satellite  
 b) aircraft  
 c) satellite launching station  
 d) none of these

91. GIS receives data from  
a) existing maps  
b) GPS  
c) remote sensing data  
d) all the above
92. Which of the following cannot be achieved by remote sensing?  
a) land use pattern  
b) detection of forest fires  
c) prevention of earthquakes  
d) none of these
93. Leachate is a coloured liquid, that comes out of  
a) sanitary landfills  
b) septic tanks  
c) compost plants  
d) aerated lagoons
94. Ozone day is observed on  
a) 3<sup>rd</sup> January  
b) 26<sup>th</sup> March  
c) 16<sup>th</sup> September  
d) 10<sup>th</sup> November
95. Greenhouse effect is related to  
a) global warming  
b) grasslands  
c) green buildings  
d) none of these
96. Bhopal gas tragedy was caused due to the leakage of  
a) Sulphurdioxide  
b) Methane  
c) Butane  
d) Methyl ISO-cyanate
97. Bhopal gas tragedy happened in the year  
a) Dec 1984  
b) Dec 1983  
c) Dec 1994  
d) Dec 1987
98. Petroleum based vehicles emit traces of  
a) CO and NO<sub>2</sub>  
b) SPM  
c) Aldehydes  
d) CH<sub>4</sub>
99. Sound beyond which of the following level can be regarded as a noise pollution?  
a) 40dB  
b) 80dB  
c) 15dB  
d) 75dB
100. Noise pollution limit at residential area  
a) 45dB  
b) 80dB  
c) 55dB  
d) 90dB

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