CBCS SCHEME

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18CV51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Construction Management and Entrepreneurship

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Discuss the ideal characteristics that a Management should exhibit. **(07 Marks)**

b. Briefly explain the key steps involved in Construction planning. **(06 Marks)**

c. What are the principles based on which organizational structure has to be framed? **(07 Marks)**

OR

2 a. What is Work break down structure? Mention its significance in Construction project. **(06 Marks)**

b. Discuss suitability , advantages and disadvantages of Autocratic and Democratic style of Management **(06 Marks)**

c. Draw the network diagram and identify critical path using CPM for the following activity data :

Activity	1-2	2-3	2-4	3-5	3-6	4-5	4-7	5-8	6-8	7-8
Duration (Days)	5	2	6	4	4	2	3	7	8	2

(08 Marks)

Module-2

3 a. What is the purpose of having material management system in construction? **(04 Marks)**

b. Enumerate the factors to be considered for selection of construction equipments. **(07 Marks)**

c. Explain different class of labour employed in construction project. **(09 Marks)**

OR

4 a. What are the factors influencing Inventory Management? **(05 Marks)**

b. Estimate the hourly production of a Shovel with bucket capacity of $0.96m^3$ and cycle time of 30 seconds. Shovel is used to excavate hard soil in an open area. Excavated earth is to be loaded in waiting dump truck, positioned at 60^0. Equipment is utilized for 50 minutes in one hour. **(07 Marks)**

c. List the factors affecting labour productivity. Briefly discuss any three factors. **(08 Marks)**

Module-3

5 a. Define Engineering Ethics. Mention the duties of Engineers, with respect to ethical practices. **(06 Marks)**

b. Discuss the importance of Inspection in Construction. **(08 Marks)**

c. Highlight the common causes of accident in Construction site. **(06 Marks)**

OR

6 a. Explain the safety measures to be adopted for excavation. **(06 Marks)**

b. With reference to profession practice, discuss i) Conflict of Interest ii) Gifts and Bribes. **(06 Marks)**

c. Explain the concept of Total Quality Management. **(08 Marks)**

Module-4

7 a. Define the following terms : i) Principal Amount ii) Rate of Interest iii) Interest Amount iv) Interest Period. **(04 Marks)**

b. Discuss the principles of Engineering Economics. **(06 Marks)**

c. There are two alternatives for purchasing a concrete mixer and details are as follows. Choose best alternative using PW method @ 10% rate of interest. **(10 Marks)**

Parameter	Alternative - 1	Alternative - 2
Purchase cost (Rs)	3,00,000/-	2,00,000/-
Annual Operating and Maintenance cost (Rs)	20,000/-	35,000/-
Expected Salvage value (Rs)	1,25,000/-	70,000/-
Useful life (years)	05	05

OR

8 a. Briefly explain the concept of Minimum Cost Analysis. **(06 Marks)**

b. A Construction Company is planning to invest Rs 8,00,000/- for purchase of construction equipment with useful life of 10 years. Equipment is expected to generate net annual profit of Rs 1,40,000/- with expected salvage value of Rs 2,00,000/-. Compute the Rate of Return and comment on the investment if Company's MARR is 10%. **(06 Marks)**

c. Initial cost of an infrastructure project, expected to serve perpetually is Rs 1,50,00,000/-. Annual maintenance cost is Rs 8,00,000/- Renovation cost at end of every 15 years is Rs 18,00,000/-. Find the capitalized cost at an interest rate of 8% per year. **(08 Marks)**

Module-5

9 a. Enumerate services offered by TECSOK. **(06 Marks)**

b. Discuss the characteristics of MSME's. **(06 Marks)**

c. Explain different concept of Entrepreneurship. **(08 Marks)**

OR

10 a. List the benefits for investors and host country in Direct Foreign Investment. **(04 Marks)**

b. Briefly discuss challenges in International Entrepreneurship. **(08 Marks)**

c. What are the different sources of Finance for Entrepreneur? Explain. **(08 Marks)**

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18CV52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Analysis of Indeterminate Structures

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 Analyze the continuous beam shown in Fig.Q1 by slope deflection method. Draw BMD, SFD and elastic curve.

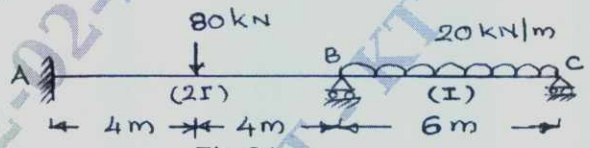

Fig.Q1 **(20 Marks)**

OR

2 Analyze the portal frame shown in Fig.Q2 by slope deflection method. Draw BMD and elastic curve.

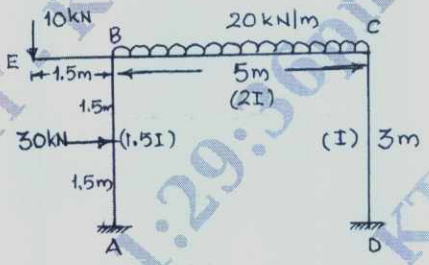

Fig.Q2 **(20 Marks)**

Module-2

3 Analyze the continuous beam shown in Fig.Q3 by using moment distribution method. Draw BMD SFD and elastic curve the support B sinks by 1 cm. Take EI = 500 kN-m^2.

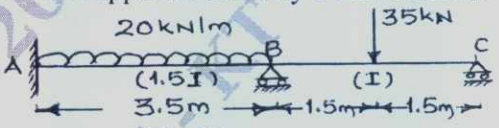

Fig.Q3 **(20 Marks)**

OR

4 Analyze the portal frame shown in Fig.Q4 by moment distribution method. Draw BMD, SFD and elastic curve.

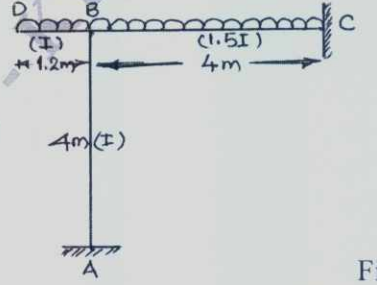

Fig.Q4 **(20 Marks)**

Module-3

5 Analyze the continuous beam shown in Fig.Q5 by using Kani's method. The support C sinks by 20 mm. Take E = 200 kN/mm^2, I = 170 × 10^6 mm^4. Draw BMD, SFD and EC.

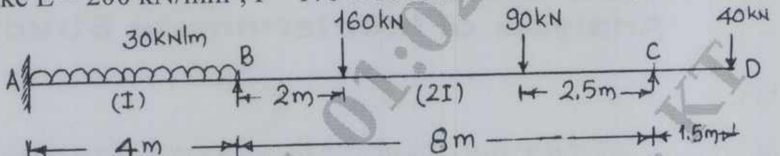

Fig.Q5 **(20 Marks)**

OR

6 Analyze the portal frame shown in Fig.Q6 by using Kani's method. Assume EI is constant throughout. Draw BMD and elastic curve.

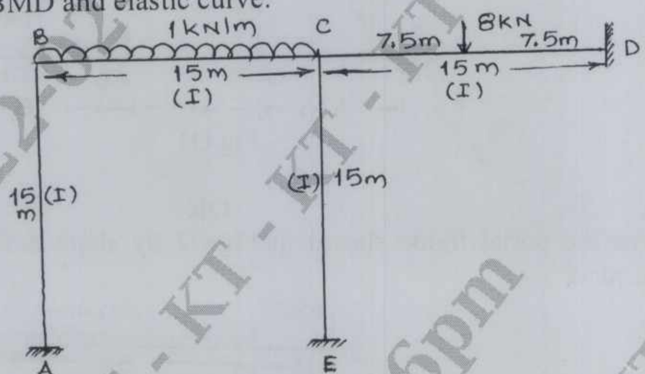

Fig.Q6 **(20 Marks)**

Module-4

7 Analyze the continuous beam by using flexibility matrix method. Draw BMD, SFD and elastic curve. Refer Fig.Q7.

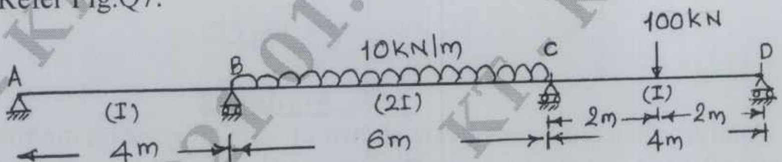

Fig.Q7 **(20 Marks)**

OR

8 Analyze the truss shown in Fig.Q8 by flexibility matrix method choosing force in the member AD as redundant. Assume constant EI for all the members.

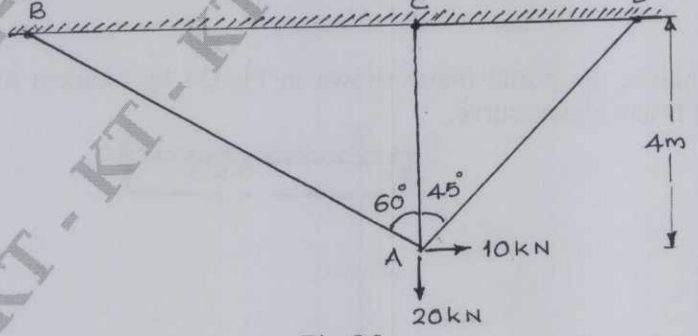

Fig.Q8 **(20 Marks)**

Module-5

9 Analyze the continuous beam shown in Fig.Q9 by using stiffness matrix method. Draw BMD, SFD and elastic curve.

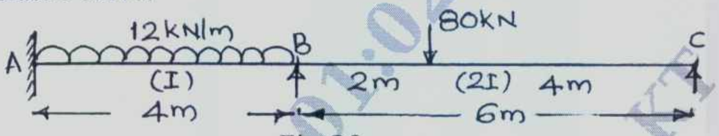

Fig.Q9 **(20 Marks)**

OR

10 Analyze the portal frame shown in Fig.Q10 by stiffness matrix method. Draw BMD and elastic curve.

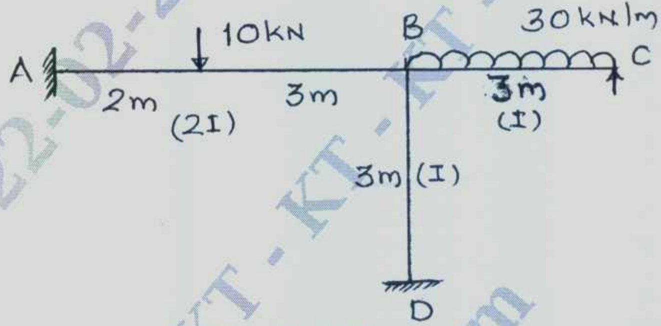

Fig.Q10 **(20 Marks)**

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18CV53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Design of RC Structural Elements

Time: 3 hrs. Max. Marks: 100

Note: 1. ***Answer any FIVE full questions, choosing ONE full question from each module.***
2. ***Use of IS : 456-2000, SP-16 is permitted.***
3. ***Assume suitable additional data, if necessary.***

Module-1

1 a. Distinguish between working stresses and limit state methods design. **(08 Marks)**

b. Write brief notes on :
i) Balanced section
ii) Under reinforced section
iii) Deflection
iv) Cracking. **(12 Marks)**

OR

2 a. Explain the factors that affect short and long term deflections. **(08 Marks)**

b. A cantilever of 3.5m span is 300mm wide and 600mm deep. It is subjected to a maximum bending moment of 125kN-m due to uniformly distributed service loads of which 50% moment is due to permanent loads. The beam is reinforced with 4 bars of 20mm diameter at an effective cover of 50mm in the tension zone. Determine the immediate deflection. **(12 Marks)**

Module-2

3 a. An RC beam of rectangular section 300mm wide and overall depth of 850mm is reinforced with 4 bars of 25mm diameter on the tension side. Effective cover is 50mm. Find the ultimate moment of resistance of the section, if $f_{ck} = 20N/mm^2$ and $f_y = 415N/mm^2$. Find the additional reinforcement required to make this a balanced section. **(10 Marks)**

b. Determine the moment of resistance of beam with the following data :
b = 350mm, d = 900mm, d′ = 50mm.
Tension reinforcement: 5-20mm of Fe415 grade; compression reinforcement 2-20mm of the same grade. Grade of concert M20. **(10 Marks)**

OR

4 a. A T-Beam of flange width 850mm, flange thickness 100mm, rib width 275mm has an effective depth of 475mm. The beam is reinforcement with 4-20mm bars. Find the ultimate moment of resistance. Use M20 concrete and Fe415 steel. **(10 Marks)**

b. Determine the shear capacity of the beam section with the following details:
Size 230mm × 720mm effective depth reinforced with 5 number of 16mm diameter with 8mm diameter stirrups @300mm C/C. Use Fe 415 steel and M20 concrete. **(10 Marks)**

Module-3

5 Design a beam of effective span 6m to support a total working load of 12kN/m including the self weight of the beam. The width of the beam is limited to 250mm. Design for flexure and shears only, No need to curtail the bars. Use 16mm diameter main bars and 8mm diameter stirrups. Use M20 concrete and Fe415 steel. Show reinforcement details. **(20 Marks)**

OR

6 A T-Beam and slab floor system has a slab 125mm thick spanning between T-Beams. Which are spaced at 3.5m apart. The beams have a clear span of 8m and end bearings are 300mm walls. The live load on the floor is $4kN/m^2$ and floor finish is $0.6kN/m^2$. Take overall depth of the beam equal to 600mm and web width to 300mm. Take self weight of the slab and web as 13.90kN/m provide 20mm diameter main bars and 8mm diameter two legged stirrups. Use M20 concrete and Fe415 steel. Design the intermediate T-Beam for flexure and shear only. **(20 Marks)**

Module-4

7 Design an RC slab for room measuring 4m × 5m is inside. The slab carries a live load of $2kN/m^2$ and is finished with 20mm topping of unit weight $24kN/m^3$. The slab is simply supported on all four edges with corners free to lift. No need to check for shear. Use M20 concrete and Fe415 steel. **(20 Marks)**

OR

8 Design a dog legged stair for an office building in a room measuring 2.8m × 5.8m, clear vertical distance between the floors is 3.6m. The width of flight is to be 1.25m. Assume imposed load of $3kN/m^2$. Use M20 concrete and Fe415 grade steel. Assume that the stairs are supported on 230mm width support at the outer edges of landing slabs. Sketch the reinforcement details. Design of one flight is enough. **(20 Marks)**

Module-5

9 a. A reinforced concrete column of 2.75m unsupported length carries an axial load of 1600kN. Design a square column using M20 concrete and Fe415 steel. Assume both ends of the column as hinged. **(10 Marks)**

b. Determine the reinforcement required for a short column for the following data :
Columns size : 300mm × 600mm, P_u = 1800kN ; M_{ux} = 110kN-m with respect to major axis. Use M25 concrete and Fe415 steel. Sketch reinforcement details. Assume 50mm effective cover. **(10 Marks)**

OR

10 A square footing has to transfer a load of 1000kN from a square column of 400mm × 400mm. Assume M20 concrete and Fe415 steel, and SBC of soil $200kN/m^2$. Design the footing and sketch reinforcement details. **(20 Marks)**

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CBCS SCHEME

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18CV54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Basic Geotechnical Engineering

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With the help of 3-phase diagram, explain (i) Void ratio (ii) Porosity (iii) Water content (iv) Degree of saturation. **(06 Marks)**

b. With usual notations, derive the relationship,

$$\gamma_d = \frac{(1-n_a)G.\gamma_w}{1+\omega G}$$ **(06 Marks)**

c. A fully saturated soil sample has a water content of 35% and specific gravity of 2.65. Determine its porosity, saturated unit weight and dry unit weight. If the w.c. is 15%, what will be the amount of water to be added for saturation? **(08 Marks)**

OR

2 a. Explain the Indian standard soil classification system. **(06 Marks)**

b. Define stoke's law. What are its assumptions and limitations? **(06 Marks)**

c. A liquid limit test on a clayey sample gave the following results. The plastic limit of the soil is 20%.

Number of blows	12	18	22	34
Water content, %	56	52	50	45

Plot flow curve and obtain:
(i) Liquid limit (ii) Flow Index (iii) Plasticity Index (iv) Toughness Index. **(08 Marks)**

Module-2

3 a. Briefly explain how water content, compactive effort and type of soil affect compaction. **(06 Marks)**

b. Distinguish between standard Proctor and Modified Proctor compaction tests. **(04 Marks)**

c. The following data was obtained from standard Proctor compaction test.

Water content, %	5.90	7.50	9.70	11.65	13.85
Weight of wet sample, N	18.20	19.50	20.10	20.00	19.70

G = 2.70, Volume of mould = 9.5×10^{-4} m^3. Plot the compaction curve and zero air voids line. Determine OMC and maximum dry density. **(10 Marks)**

OR

4 a. Explain with sketches the various soil structures. **(06 Marks)**

b. With sketch explain the three principal clay minerals. **(08 Marks)**

c. Explain electrical diffuse double layer and adsorbed water. **(06 Marks)**

Module-3

5 a. Derive the equations for average coefficient of permeabilities in vertical and horizontal directions. **(08 Marks)**

b. Explain with a neat sketch the method of locating the phreatic line in a homogeneous earth dam with horizontal filter. **(06 Marks)**

c. If during a variable head permeability test on a soil sample, equal time intervals are noted for drops of head from h_1 to h_2 and again from h_2 to h_3. Find the relationship between h_1, h_2 and h_3 **(06 Marks)**

OR

6 a. State the characteristics and uses of flownets. **(06 Marks)**

b. Explain the terms superficial velocity and seepage velocity. Derive the relationship between them. **(08 Marks)**

c. Compute the quantity of water seeping under a weir per day for which the flownet has been satisfactorily constructed. The coefficient of permeability is 2×10^{-2} mm/s. $n_f = 5$ and $n_d = 18$. The difference in water level between upstream and downstream is 3.0 m. The length of the weir is 60 m. **(06 Marks)**

Module-4

7 a. What are the advantages and disadvantages of direct shear test over triaxial test? **(06 Marks)**

b. Explain sensitivity and thixotropy of clay. **(06 Marks)**

c. The stresses on a failure plane in a drained test on a cohesionless soil are as under:
Normal stress (σ) = 100 kN/m^2
Shear stress (τ) = 40 kN/m^2
Determine the angle of shearing resistance and the angle which the failure plane makes with the major principal plane. Also find the major and minor principal stresses. **(08 Marks)**

OR

8 a. Explain Mohr-Coulomb failure theory of soils. **(06 Marks)**

b. Explain Vane shear test with a neat sketch. **(06 Marks)**

c. A consolidated undrained test was conducted on a clay sample and the following results were obtained:-

Cell pressure (kN/m^2)	200	400	600
Deviator stress at failure, kN/m^2	118	240	352
Pore water pressure at failure, kN/m^2	110	220	320

Determine the shear strength parameters with respect to,

(i) Total stresses.

(ii) Effective stresses. **(08 Marks)**

Module-5

9 a. Explain spring analogy theory of consolidation of soil. **(08 Marks)**

b. What is pre consolidation pressure? How is it determined by Casagraude's graphical method? **(06 Marks)**

c. In a consolidation test, the void ratio of soil sample decreases from 1.20 to 1.10 when the pressure increases from 160 to 320 kN/m^2. Determine the coefficient of consolidation, if the coefficient of permeability is 8×10^{-7} mm/sec. **(06 Marks)**

OR

10 a. Explain square root of time fitting method. **(06 Marks)**

b. A 20 m thick isotropic clay layer overlies an impervious rock. The coefficient of consolidation of soil is 5×10^{-2} mm^2/sec. Find the time required for 50% and 90% consolidation. Time factors are 0.2 and 0.85 for 50% and 90% consolidations respectively. **(08 Marks)**

c. Explain pre consolidated, normally consolidated and under consolidated soil. **(06 Marks)**

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CBCS SCHEME

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18CV55

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Municipal Wastewater Engineering

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the necessity of treating waste water. **(08 Marks)**

b. Explain with a neat sketch, construction and working of a manhole. **(08 Marks)**

c. Explain the principles of house drainage. **(04 Marks)**

OR

2 a. Define wet weather flow. Explain factors affecting wet weather flow. **(08 Marks)**

b. The drainage area of one sector of a town 100 hectares having a population of one lakh persons, the rate of water supply is 150 LPCD, 80% of which flows out as sewage. The peak flow of sewage is 2.5 times the average flow. The area of the town is classified as follows:

Percentage of total area	Type of Surface	Run off coefficient
45	Hard pavements and roofs	0.85
20	Unpaved	0.45
20	Garden and lawn	0.25
15	Wooded area	0.15

If time of concentration for the area is 30 minutes. Find the maximum run off. Use the following formula for intensity of Rainfall $R = \frac{900}{(t+60)}$. **(08 Marks)**

c. What are traps? Explain the importance of traps. **(04 Marks)**

Module-2

3 a. Write the flow diagram employed to treat municipal waste water and indicate the importance of each treatment unit. **(08 Marks)**

b. Find the minimum velocity and gradient required to transport coarse sand through a sewer of 60 cm diameter with sand particle of 1 mm diameter and specific gravity 2.66. Assume $\beta = 0.06$ and $f = 0.02$. Assume the sewer to run half full. Take $N = 0.012$. **(08 Marks)**

c. What is sampling? Mention types of sampling. **(04 Marks)**

OR

4 a. Explain the concept of BOD and COD. Enumerate their limitation. **(08 Marks)**

b. The BOD of a sewage incubated for one day at 30°C has been found to be 100 mg/l. What will be the 5 day 20°C BOD? Assume K = 0.12 (Base 10) at 20°C. **(08 Marks)**

c. Briefly explain self cleansing velocity. **(04 Marks)**

Module-3

5 a. Discuss the importance of screening in waste water treatment operation and explain types of screens. **(08 Marks)**

b. What do you understand by self purification of natural water bodies? Explain the factors affecting self purification. **(08 Marks)**

c. Explain sewage farming. Mention the various methods of sewage farming. **(04 Marks)**

OR

6 a. With neat sketch, explain the different zones of self purification. **(08 Marks)**

b. A stream saturated with DO, has a flow of 1.2 m^3/s, BOD of 4 mg/l and rate constant of 0.3 per day. It receives an effluent discharge of 0.25 m^3/s having BOD 20 mg/l DO 5mg/l and rate constant 0.13 per day. The average velocity of flow of the stream is 0.18 m/s. Calculate the DO deficit at point 20 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20°C as 9.17 mg/l. **(08 Marks)**

c. Draw a neat sketch of skimming tank. Enumerate importance of skimming tank. **(04 Marks)**

Module-4

7 a. Explain with neat sketch the working of Trickling Filter. What is the principle on which it working? **(08 Marks)**

b. Explain the different stages involved in the sludge digestion process. **(08 Marks)**

c. Briefly explain R.B.C. **(04 Marks)**

OR

8 a. Mention the various types of modification of ASP and explain any two methods in brief. **(08 Marks)**

b. Design suitable dimensions of a circular trickling filter units for treating 5 million litres of sewage per day BOD of sewage is 150 mg/l. **(08 Marks)**

c. Write short note on drying beds. **(04 Marks)**

Module-5

9 a. Discuss in brief the Nitrification and Denitrification process in advance waste water treatment. **(08 Marks)**

b. Draw a neat sketch of septic tank. Write the design criteria required for septic tank. **(08 Marks)**

c. Write a short note on advance oxidation process. **(04 Marks)**

OR

10 a. Discuss in brief the biological and chemical methods of removal of phosphorous from waste water. **(08 Marks)**

b. Write short notes on:
(i) Electro coagulation
(ii) Soak pits
(iii) Eco toilets **(12 Marks)**

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18CV56

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Highway Engineering

Time: 3 hrs. Max. Marks: 100

Note: 1. *Answer any FIVE full questions, choosing ONE full question from each module.*
2. *Assume the missing data, if any, as per IRC codes.*

Module-1

1 a. List the objectives and functions of the following in Highway development in India.
i) Indian Roads congress
ii) Central Road Research Institute. **(06 Marks)**

b. What is the contribution of KRDCL and KSHIP in the road development in Karnataka? **(08 Marks)**

c. List and elaborate the various advantages and disadvantages of Road transport compared with other modes of transport. **(06 Marks)**

OR

2 a. Elaborate on various salient features of VISION 2021. **(06 Marks)**

b. What are the various factors affecting highway alignment? Explain each one, in detail with the help of neat sketches. **(08 Marks)**

c. What are the objectives of preliminary survey in highway Alignment? Enumerate the detail to be collected in it. **(06 Marks)**

Module-2

3 a. Calculate the stopping sight distance on a highway for a vehicle moving at 80kmph on a
i) Level Road
ii) On a road having 1 in 100 grade (ascending and descending)
Assume other data as per IRC recommendations. **(08 Marks)**

b. Explain PIEV theory with a neat sketch. **(06 Marks)**

c. What are the various factors affecting friction? Also explain skid and slip failures, in detail. **(06 Marks)**

OR

4 a. Enumerate the steps for practical design of super elevation considering mixed traffic. **(06 Marks)**

b. Find the total width of pavement on a horizontal curve for a two lane National highway to be aligned along a rolling terrain with ruling minimum radius. **(08 Marks)**

c. List the various objects of providing a horizontal transition curve? Also explain the various shapes of transition curve and ideal transition curve. **(06 Marks)**

Module-3

5 a. List and explain the various desirable properties of subgrade soil as highway material. **(06 Marks)**

b. List the various properties of coarse aggregate and the tests to be conducted to find each property of course aggregate. **(06 Marks)**

c. How do you find CBR value in the Laboratory? Explain the test procedure with a neat sketch. **(08 Marks)**

OR

6 a. A plate load test was conducted on a soaked subgrade during monsoon season using a plate of diameter 30cm. The load values corresponding to the mean settlement dial readings are given below. Determine the modulus of subgrade reaction for the standard plate :

Mean settlement value, in mm	0.0	0.26	0.52	0.76	1.02	1.26	1.53	1.76
Load values, in Kg	0.0	540	1010	1290	1510	1550	1730	1900

(08 Marks)

b. What do you understand about HRB soil classification? Explain in detail? **(06 Marks)**

c. Calculate the ESWL of a dual wheel assembly arraying 2044kg each for a trail pavement thickness values of 150, 200 and 250mm, if the centre to centre spacing between the two tyres = 270mm, clear gap between the wall of the tyres = 110mm **(06 Marks)**

Module-4

7 a. With a neat sketch, explain the method of determining the aggregate- bituminous mixes proportioning by Rothfuch's method. **(08 Marks)**

b. List the explain the various construction steps in the WMM base construction. **(06 Marks)**

c. What do you understand by Tack coat and Prime coat? List the various objectives of providing these in pavements. **(06 Marks)**

OR

8 a. Explain the various steps in the construction of Dense bituminous macadam pavement. **(10 Marks)**

b. Step by step, explain in detail, construction of Dry Lean Concrete sub base course. **(10 Marks)**

Module-5

9 a. List the objects of
   i) Surface drainage
   ii) Sub surface drainage of roads. **(06 Marks)**

b. What are various cross drainage structure? Explain each one of those. **(05 Marks)**

c. What do you understand by
   i) Lowering of water table
   ii) Control of seepage flow
   iii) Control of capillary rise.

   Explain with neat sketches. **(09 Marks)**

OR

10 a. Compare the annual costs of a 2 lane road for two types of pavement structures
   i) WBM with thin bituminous surface at a total cost of Rs 100 lakhs per km, life of 10 years, interest at 10%, with a salvage value of Rs 2.50 lakhs after 10 years, and annual average maintenance cost of Rs 5 lakhs/km
   ii) Bituminous macadam base and bituminous concrete surface, with a total cost of Rs 200 lakhs/km, life of 15 years, interest at a rate of 8%, salvage value of 3.50 lakhs at the end of 15 years, with annual average maintenance cost Rs 7.5 lakhs/km. Comment which one is more economical? **(08 Marks)**

b. What is Public Private Partnership? How it will help the Road projects in India? Explain. **(06 Marks)**

c. What are the various advantages and disadvantages of Benefit cost ratio method? Explain the method with formulae. **(06 Marks)**

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CBCS SCHEME

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Question Paper Version : C

Fifth Semester B.E Degree Examination, Jan./Feb. 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.

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1. The primary source of Green House Gases (GHG) is
   a) Wind b) Fossil fuel c) Water d) Green plants

2. The Kyoto protocol was adopted at the
   a) Third conference of UNFCC in 1997
   b) Convention on the trans boundary effects of industrial accidents
   c) United nations framework convention on climate change in 1992
   d) convention on Biological diversity

3. Which one of following is not a green house gas?
   a) Water vapour b) Oxygen c) Methane d) Carbon monoxide

4. E.T.S stands for
   a) Emission Tracking system b) Europe Trading System
   c) Environmental Tracking System d) Engine Tracking System

5. The primary cause of acid rain around the world is due to
   a) Carbon dioxide b) Sulphur dioxide c) Carbon monoxide d) Ozone

6. Ozone layer is present in
   a) Troposphere b) Stratosphere c) Mesosphere d) Thermosphere

7. Sustainable development means
   a) Meeting present needs without compromising on future needs
   b) Progress in human well beings
   c) Balance between human needs and ability of earth to provide the resources
   d) All the above

8. Which of the following element make e-waste hazardous in nature?
a) Lead b) Glass c) Plastic d) Iron

9. What is the hazardous pollutant released from LED?
a) Arsenic b) Barium c) Cobalt d) Cadmium

10. Cyotoxic and expired drugs are disposed off by
a) Dumping b) Autoclave
c) Incineration d) Chemical disinfection

11. Eco-toxicology is study of
a) Chemical interaction of organism and environment
b) Physical interactions of organism and environment
c) Thermal interaction of organism and environment
d) Biological interaction organism and environment

12. What is the 1st step in primary treatment plants?
a) Fine screening b) Course screening c) Chlorination d) Oxidation

13. What are the sources of air pollutants in the atmosphere?
a) Coal fired power station b) Vehicle exhaust
c) Industries d) Coal

14. Which of the following chemicals damage the ozone layer?
a) Polyvinyl chloride b) Chlorofluorocarbons
c) DDT d) Hydroflurocarbons

15. Which of these energy source is renewable?
a) Wind b) Nuclear c) Coal d) Oil

16. Which one of the following is a great achievement of the Chipko movement?
a) More trees are planted b) Development in Himalayan region
c) Successfully resisted deforestation d) Soil erosion gets declined

17. The percentage of forest cover in India is
a) 14.69% b) 15.39% c) 19.39% d) 19.67%

18. GIS stands for
a) Geographic Information System b) Generic Information System
c) Geological Information System d) Geographic Information Sharing

19. The effect of Acid Rain is
a) Reduces soil fertility b) Increases atmospheric temperature
c) Causing respiratory problem d) Skin cancer

20. Environmental protection is reasonability of
a) Government of India b) NGO
c) Individual d) All of these

21. People who are exposed to radon in drinking of water may have risk of getting
a) Cancer b) Typhoid
c) Blue baby syndrome d) Cholera

22. Remote sensing uses which of the following waves in its procedure.
a) Sonar waves b) Electromagnetic waves
c) Gamma ray d) None of these

23. What is called for the practice of regulating forest resources to meet the society and industry while preserving forest health?
a) Environmental Protection b) Sustainable forest management
c) forest policy d) Unsustainable forest management

24. Soil erosion is prevented by
a) Deforestation b) Afforestation
c) Overgrazing d) Removal of vegetation

25. Which one of the following states is the leading produce of iron ore?
a) Chhattisgarh b) Jharkhand c) Karnataka d) Madhya Pradesh

26. Prevention and Control of Air Pollution Act in India was passed
a) 1970 b) 1975 c) 1981 d) 1990

27. An important NGO involved in Global Environmental Protection.
a) UNICEF b) Green Peace c) WHO d) CPCB

28. Which one of the following is a source of sulphur dioxide in atmosphere?
a) Volcanoes b) Thermal power station
c) H_2SO_4 manufacturing d) All of these

29. The important non-metallic resource is
a) Petroleum b) Bauxite c) Sidertile d) None of these

30. Which of the following reservoirs contain most water?
a) Atmosphere b) biosphere c) Ground water d) Lakes and rivers

31. Which of the following is not the meaning of ecosystem?
i) Unit where in all organisms live a healthy life
j) A small unit that can be self sufficient
k) Co-existence of diverse things by mutual adjustment
l) A unit which includes all the organisms in a given area interacting with physical environment to from a natural unit of stability

32. The factors responsible for stable ecosystem are balance between
a) Predators and prey b) Vegetation, herbivores and carnivores
c) Competing species and biotic factors d) All of these

33. Which of it is not an example of ecosystem?
a) Forest b) Desert c) Water d) Grassland

34. E.I.A can be expanded as
a) Environment and Industrial Act b) Environment and Impact Activities
c) Environmental Impact Assessment d) Environmentally Important Activity

35. Earth day is held every year on
a) 5th June b) 23rd Nov c) 22nd April d) 26th Jan

36. Soil erosion removes surface soil which contains
a) Organic matter b) Plant nutrients c) Both a and b d) None of these

37. Mineral resources are
a) Renewable b) Non-renewable c) Equally distributed d) None of these

38. Fluoride though is an effective agent to prevent dental caries has a permissible limit of
a) 0.5 mg/lit of water b) 1.5 mg/lit of water
c) 5 mg/lit of water d) 1.0 mg/lit of water

39. Deforestation means
a) Maintenance of forest for recreation
b) Creating land for habitant of wild life
c) Conversion of forest land to agricultural land homes etc
d) Planting trees

40. Decrease of oxygen level in water mainly causes
a) Fluorosis b) Death of aquatic life
c) Water purification d) All of these

41. Select the correct statement about biodiversity.
a) The desert animals of Rajasthan and Gujrat have a very high of animal species as well as rare animals.
b) Large scale planting of biodiversity cotton has no adverse effect on biodiversity
c) Western Ghats have a very high degree of species richness and endemism
d) Conservation biodiversity is just a fad pursued by developing countries

42. Global warming can be controlled by
a) Reducing deforestation and cutting down the use of fossil fuel
b) Reducing afforestation and increasing the use of fossil fuel
c) Increasing the deforestation and increasing the growth of human population
d) Increasing deforestation and increasing the use of fossil fuels

43. Bhopal Gas Disaster is a kind of
a) Natural disaster b) Man-made disaster c) None of these d) Water leakage

44. The instrument which records earthquake wave is called
a) Climograph b) Seismograph c) Hyther graph d) None of these

45. Which of the following diseases appeared as public health concern in the last quarter of 20^{th} century?
a) HIV b) Ebola virus c) Corona Virus d) All of these

46. The National Disaster Management Authority (NDMA) is headed by
a) President of India b) Prime minister of India
c) Governor of States d) Chief Minister of States

47. Cloud seeding is process of
a) Adding chemical material to cloud to obtain precipitation
b) To get more rainfall
c) It is artificial process to get rainfall during drought
d) All the above

48. Which of the following has been used to seed clouds?
a) Silver iodide b) Silver chromate
c) Sodium Chloride d) Potassium chromate

49. The scientist who experimented cloud seeding first time
a) Isaac Newton b) Vincent Schaefer c) Rutherford d) C.V. Raman

50. Carbon trading deals
a) Carbon emissions b) Acid rain
c) Sulphur dioxide emissions d) None of these

51. Extensive planting of trees to increase forest cover is called
a) Afforestation b) Deforrestation c) Agro forestation d) None of these

52. The percentage of geographical area of country under forest cover is
a) 23% b) 43% c) 13% d) 33%

53. What is the permissible range of pH for drinking water as per Indian standards?
a) 6 to 9 b) 6.5 to 7.5 c) 6 to 8.5 d) 6.5 to 8.5

54. Forest rich area in Karnataka is found in
a) Western Ghats b) Bandipur c) Nagarhole d) Mangalore

55. Major sources of fluoride is
a) River water b) Tooth paste c) Ground water d) food products

56. The oceans are the largest storage of water on earth containing
a) 95% of earths water b) 85% of earths water
c) 97% earths water d) 75% of earths water

57. Solar energy is an ideal energy source because of
a) Unlimited supply b) No air and water pollution
c) No hazardous byproducts d) All of these

58. The only disadvantages of hydrogen energy source
i) Takes more energy to produce hydrogen than the energy that could be obtained from it.
j) Causes air and water pollution
k) Releases toxic byproducts
l) Hazardous effect due to risk of leakage

59. Wind energy generation depends on
a) Directions of wind b) Velocity of wind
c) Humidity d) All of these

60. 'OTEC' is an energy technology that converts
a) Energy in large tides of ocean to generate electricity
b) Energy in ocean waves to generate electricity
c) Energy in ocean due to thermal gradient to generate electricity
d) Energy in fast moving ocean currents to generate electricity

61. The Environmental Protection Act 1986 deals with
a) Water b) Air c) Soil d) All of these

62. How to remove leachate from landfill?
a) By gravity
b) By pumping from low points
c) Both a and b
d) None of these

63. Ground water is a source of trouble at which place
a) Plains
b) Slopes
c) Rivers
d) Lakes

64. The hot spots of biodiversity are characterized by
i) Low endemicity and low threat of extinction
j) Low endemicity and high threat of extinction
k) High endemicity and low threat of extinction
l) High intensity and threat of extinction

65. The world environment day is on
a) 5th June
b) 3rd October
c) 25th December
d) 11th July

66. Fossil fuels are converted into energy by
a) Burning
b) Cooling
c) Sublimation
d) Melting

67. Which place in India the tidal energy has been experimented?
a) Goa
b) Karnataka
c) Kerala
d) Tamil Nadu

68. India has the largest share of
a) Manganese
b) Mica
c) Copper
d) Diamond

69. Which of the following are major environmental issues involved in mining?
a) Air pollution from dust
b) Water pollution
c) Soil degradation
d) all of these

70. In an ecosystem the flow of energy is
a) Bidirectional
b) Cyclic
c) Unidirectional
d) Multidirectional

71. COD is
a) Chemical Oxygen Demand
b) Measure of dissolved impurities in water
c) Amount of oxygen required to oxidize organic and organic impurities
d) All the above

72. Which of the following compounds may be toxic to human beings?
a) Amino acids
b) Polychlorinated biphenyl
c) Vitamins
d) Proteins

73. Many rivers polluted due to
a) Heavy flux of sewage
b) Industrial effluents
c) Agricultural and domestic waste
d) All of these

74. The sound intensity in measured in
a) dB
b) NB
c) Horse power
d) MB

75. Air Pollution from automobiles can be controlled by fitting
a) Electrostatic precipitator
b) Wet Scrubber
c) Catalytic converter
d) All of these

76. Sound above what level are considered hazardous noise pollution
a) above 75 dB b) above 30 dB c) above 150 dB d) above 120 dB

77. Noise pollution at residential area
a) 45 dB b) 80 dB c) 55 dB d) 90 dB

78. Which of the following is not a man-made hazard?
a) Leakage of toxic waste b) Wars and civil strife
c) Drought d) Environmental pollution

79. The Bhopal gas tragedy was caused due to
a) Methyl isocyanate leakage b) Nitrous oxide leakage
c) Acid rain d) Radioactive poisoning

80. The Kyoto protocol is
a) The response to treat the climate change
b) To reduce the emission of green house gases
c) a and b
d) To give permission to emit green house gases

81. World Summit on sustainable development was held at
a) Johansberg in 2002 b) Rio de Janerio in 1992
c) Kyoto in 1994 d) Stockhom in 2000

82. Ozone layer thickness is measured in
a) PPM b) PPB c) Decibels d) Dobson units

83. Which of following related to GIS?
a) Euclidean space b) Ramanujan space c) Pythagorean space d) None of these

84. Remote sensing techniques make use of the properties of following radiation by the sensed objects
a) Electric waves b) Sound waves
c) Electromagnetic waves d) Wind waves

85. What is the fullform of NGOs?
a) Non Governmental Organization b) Null Governmental Organizations
c) Nice Governmental Organization d) None of these

86. Which one of the following has maximum genetic diversity in India?
a) Tea b) Teak c) Mango d) Wheat

87. The carbon "credit is permit" is permit representing the right to emit
a) One tone of Carbon Dioxide b) 10 tonnes of Carbon Dioxide
c) 5 tonnes of Carbon Dioxide d) 15 tonnes of Carbon Dioxide

88. What is the role of NGOs in natural resource management?
a) Creating awareness among the public on current environmental issues and solution
b) Being involved in the protection of human rights to a clean environment
c) Data generation on natural resources time line and history
d) Making profit from Government

89. The primary objective of ISO14001 is
   i) An internationally agreed standard sets out the requirements for an environmental manage system
   j) It helps organizations to improve their environmental performance through more efficient use of resources
   k) It helps organization for the reduction of waste gaining competitive advantage and trust of stakeholders
   l) All the above

90. Which one of the following in not a renewable exhaustible natural resource?
a) Aquatic animals b) Wild life c) Soil fertility d) Minerals

91. Excess fluoride in drinking water is likely to cause
a) Blue babies b) Fluorosis c) Fever d) Cough and chill

92. All the following waste can be incinerated except
a) Reactive Chemical Waste b) Vaccine
c) Mutilated parts d) Discarded drugs

93. Which Vaccination should be given to workers who deals with biomedical waste?
a) Hbs Ag b) Tetanus c) Rabies d) Both a and b

94. Nickel is released from
a) Alloys b) Display c) Calculators d) Circuit boards

95. Which of the following solid wastes describes the term 'Municipal Solid Waste'?
a) Toxic b) Hazardous c) Non toxic d) Non-hazardous

96. The blue baby syndrome is caused by the contamination of water due to
a) Phosphates b) Sulphur c) Arsenic d) Nitrates

97. The organic material of solid waste will decompose
a) By the flow of water b) By filtration
c) By drying d) By the oxidation in presence of oxygen

98. The pH value of the acid rain water is
a) 5.7 b) 7.0 c) 8.5 d) 7.5

99. The global warming may bring about the following changes in atmosphere
a) Increase in temperature of earth b) Drought
c) direct impact on human health d) All of these

100. Which agency deals with the health effect that may occur from environmental exposure to toxic chemicals?
a) Environmental Protection Agency
b) The Center for Disease Control and Prevention
c) The Agency for Toxic Substances and Disease Registry
d) The Nuclear Regulatory Commission

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