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BE3255 BASIC CIVIL AND MECHANICAL ENGINEERING

IMPORTANT QUESTIONS AND QUESTION BANK

UNIT-I OVERVIEW OF CIVIL AND MECHANICAL ENGINEERING

2-Marks

1. What are the Sub-disciplines of civil engineering?
2. Classify the types of Structures?
3. Compose some common structural materials?
4. Define structural engineering?
5. Explain the branches of geotechnical engineering?
6. List the Objectives of water resources?
7. What is the difference between water scarcity and water stress?
8. State few specialized sub disciplines in Mechanical Engineering?
9. Specify the functions of Production in Engineering?
10. State the different forms of Energy available?

Part-B

1. Describe in details the contribution of civil engineering for the welfare of the society?
2. Describe the different modes of transportation?
3. Explain the features of structural engineering? Explain the role of civil engineers in construction engineering?
4. What are the criteria for selection of construction materials? Explain the role of civil engineers in Transportation and Environmental engineering?
5. What are all the solutions needed to improve the ground and soil? What are all the factors affecting the water resources?
6. State the significance of Geotechnical Engineering? Explain the various techniques used in Geotechnical Engineering?
7. Explain in detail the contributions of Mechanical Engineering to the welfare of Society?
8. Explain in detail the significance of Production Engineering?
9. Explain the significance and functions of Automobile Engineering?
10. Explain in detail the features of Energy Engineering?
11. Describe in detail, the functions of Fluid Mechanics? Specify the significance of Fluid Machinery?
12. Describe the various forms and sources of energy?
13. Compose all the factors considered for the site preparation for construction?
14. Explain the Environmental engineering aspects?
15. Compose all the major components in Automobile system?

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UNIT-II SURVEYING AND CIVIL ENGINEERING MATERIALS

2-Marks

1. Classify the types of Cement?
2. List the objectives of Surveying?
3. Define leveling?
4. Discuss the applications of Surveying?
5. Differentiate WCB from RB?
6. Differentiate surveying and leveling?
7. Define surveying?
8. Compose the uses of cement?
9. Estimate the importance of RCC?
10. Classify the types of steel sections?

Part-B

1. Summarize the principles of surveying?
2. (I) Calculate the back bearings for the following fore bearings. AB: 80˚30', BC: 150˚15', CD: 270˚20'and DE: 325˚30' (II) Calculate WCB for the following quadrant bearings. PA: N 15˚E, PB: S 25˚45' EC: S 45˚ 30' W PD: N 10˚W?
3. Explain the classification, qualities and constitution of brick?
4. Discuss the properties and uses of cement concrete?
5. The area enclosed between the survey line, irregular boundary line, first and last offsets by Mean ordinate rule, Simpson's rule and trapezoidal rule. The following perpendicular offsets were taken at 10m intervals from a survey line an irregular boundary line: 0.00, 3.20, 5.40, 6.00, 4.21, 3.88, 6.20, and 0.00?
6. Describe the different types of cement. Explain their properties and uses?
7. Explain the ingredients of cement along with their properties?
8. Describe the tests conducted on bricks?
9. Explain with neat sketch a dumpy level and indicate its parts?
10. Classify the various types of surveying and explain any two in detail?
11. Describe the different types of concrete? Explain the classification of Levelling?
12. What are the characteristics of Contours and the uses of Contour maps?
13. The following staff readings were observed successively with a level, the instrument have been moved after third, sixth and eighth readings: 3.150, 1.605,0.920,2.600,2.900, 1.125, 0.605, 2.265 m. calculate the R.L of

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points if the first reading was taken with a staff held on a bench mark of 110.0 m carryout the arithmetic check?

14. Discuss the classification of steel in detail?
15. Compose the role of timber and recent modern materials in building construction?

UNIT III BUILDING COMPONENTS AND INFRASTRUCTURES

2-Marks

1. Define safe bearing capacity of soil?
2. Define Masonry?
3. Define stone masonry?
4. How buildings are classified based on purpose?
5. Define corbel?
6. Classify different types of foundation used for buildings?
7. What are the requirements of good flooring??
8. Classify the types of flooring?
9. List out the function of columns?
10. Why Rainwater harvesting is important?

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Part-B

1. What are the types of foundation? Write down the requirements of good foundation?
2. Compare the different types of pile foundation?
3. What are the types of beams? Explain it in detail?
4. Discuss the different type of bonds in masonry?
5. Compare brick masonry and stone masonry?
6. Describe the different stages in plastering?
7. Differentiate storage dam and diversion dam?
8. Explain the different types of roofs with neat sketch?
9. Explain Rainwater harvesting in detail?
10. What are all the factors influencing the selection of dams? Explain any one type of them with neat sketch?
11. What are the factors affecting bearing capacity of soil? Describe the methods for improving the bearing capacity of soil?
12. What are all the causes for foundation failure? Explain with precautions or remedies?
13. Explain the various sources of water supply? Explain the quality of the water?

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14. Explain the components of railway track?
15. Describe any two types of bridge with neat sketch?

UNIT IV INTERNAL COMBUSTION ENGINES AND POWER PLANTS

2-Marks

1. List out the main components of an I.C. engine?
2. Define the term: Cavitation?
3. What are the types of reactors??
4. Compare reaction turbine with impulse turbine?
5. Recommend the condition for which impulse turbine is preferred?
6. What is meant by prime movers and how is it classified?
7. Design the layout of water cooling system?
8. Differentiate two stroke and four stroke engines?
9. Distinguish between I.C Engine and E.C. Engine?
10. Differentiate fire tube boiler and water tube boiler?

Part-B

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1. Define the terms: Bore, Stroke, TDC, BDC, Clearance volume, Swept volume and compression ratio of an IC engine?
2. Explain and compare Four stroke diesel engine and petrol engine with neat sketch?
3. Explain the working principle of hydroelectric power plant with neat sketch and state the merits and demerits of power plant?
4. Explain briefly about Two Stroke Diesel engine with neat sketch?
5. Describe the parts and functions of a Two Stroke Petrol engine with neat sketch?
6. Briefly explain the various parts of Cochran boiler?
7. State the various difference between the fire tube and water tube boiler? Draw the neat sketch of a High pressure La- Mont boiler and explain its description?
8. Describe the principal, parts and functions of a BENSON boiler with neat sketch?
9. Describe the working principle of thermal power plant and explain the advantages and disadvantages?
10. Tabulate the technical difference between centrifugal pump and Reciprocating pump? Differentiate the working principle of single acting and double acting Reciprocating pump with sketch?
11. Demonstrate the layout of nuclear power plant and explain the nuclear fission and nuclear fusion and its merits and demerits?

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12. Explain the working principle of Open and closed cycle gas turbine power plant with neat sketch and state the merits and demerits?
13. Differentiate between the Impulse and Reaction turbine? Mention the advantages and disadvantages of Kaplan and Francis turbine?
14. Explain the working principle of Kaplan and Francis turbine with neat sketch?
15. Compare four stroke and two stroke engines? Compare petrol (SI) engines and diesel (CI) engines?

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM

2-Marks

1. Define the term refrigeration?
2. Define Ton of Refrigeration?
3. Examine the COP of the refrigeration system?
4. What are the applications of Refrigeration?
5. Why are capillary tubes used in domestic refrigerator?
6. Explain the principle of vapour compression refrigeration?
7. What is meant by air conditioning?
8. Differentiate air conditioning and Refrigeration?
9. How air conditioning systems are classified based on functions?
10. How do you express the capacity of a room air conditioner?

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Part-B

1. List the comfort requirements of conditioned air in an airconditioned Room. Explain what are (1) Dry bulb, Wet bulb and Dew point temperatures (2) Humidity and Relative humidity (3) Dry and moist air. Distinguish between DBT and WBT?
2. Describe with neat sketch of vapour absorption refrigeration system?
3. Describe with neat sketch of vapour compression refrigeration system. List out the components and their functions?
4. Distinguish between 'CFC Refrigerant', 'HFC Refrigerant', and 'HCFC Refrigerant'. Mention also one common refrigerant under each category?
5. Compare the vapour absorption refrigeration system and vapour compression refrigeration system. Give either reason or brief explanation for each point of comparison?
6. How is the air conditioning system classified?
7. Illustrate with neat sketch the working principle of a window type room air conditioner?
8. Compare the window and split type air conditioner and its advantages and disadvantages?

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9. Explain Domestic refrigerator with neat sketch?
10. Briefly explain the commonly used Refrigerants? Explain central air conditioning system in detail?
11. What are all the basic requirements of comfort Air conditioning?
12. Briefly explain the Application of refrigeration system? What are all the important actions involved in the operation of the air conditioner?
13. Give some suggestions to store food in refrigerator effectively?
14. Draw the layout of typical domestic refrigerator and explain it in detail?
15. Explain the detail about the application of air conditioning in both comfort and industries?

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