Reg. No.:

**Question Paper Code : D 2315**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010,

Eighth Semester

Mechanical Engineering

MG 1452 — ENGINEERING ECONOMICS AND COST ANALYSIS

(Common to Production Engineering and Automobile Engineering, Mechatronic Engineering and Metallurgical Engineering)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

(Interest Tables may be provided)

Answer ALL questions.

**PART A — (10 x 2 = 20 marks)**

1. Write about the cash flow in a simple economy.

2. Distinguish between technical and economic efficiency.

3. What would be the future value of Rs. 100 invested in a fixed deposit for 5 years with an interest rate of 15% compounded annually?

4. What is time value of money?

5. Define IRR and MARR.

6. How does present worth method help in comparing alternatives?

7. What is preventive maintenance?

8. List down the types of replacement problem?

9. What is depreciation fund?

10. Give the expression for the calculation of depreciation under sum of years-digits method of depreciation.
PART B — (5 x 16 = 80 marks)

11. (a) (i) Draw a breakeven chart and explain its components. (8 + 8)

(ii) From the following figures find out

(1) the break-even sales quantity

(2) the break-even sales

(3) if the production quantity is 30,000, find contribution and margin of safety.

Fixed cost = Rs. 10,00,000; Variable cost per unit = Rs. 50; Selling price per unit = Rs. 100.

Or

(b) What is process planning? What are its objectives? Explain the various steps in process planning. (2 + 2 + 12)

12. (a) Write about the aims of value engineering and briefly explain the steps of value engineering.

Or

(b) Mr. Ganesh is planning for his retired life. He has 10 more years of service. He would like to deposit 20% of his salary, which is Rs. 10,000, at the end of the first year and thereafter he wishes to deposit every year with an annual increase of Rs. 2,000 for the next 9 years. At an interest rate of 20%. Find the total amount at the end of the 10th year at which time he retires.

13. (a) The cost of erecting an oil well is Rs. 1,50,00,000. The annual equivalent yield from the oil well is Rs. 30,00,000. The salvage value after its useful life of 10 years is Rs. 2,00,000. Assuming an interest rate of 18%, compounded annually, find out whether the erection of the oil well is financially feasible, based on the present worth method.

Or

(b) A person is planning a new business. The initial outlay and cash flow pattern for the new business are as listed below. The expected life of the business is five years. Find the rate of return for the new business.

<table>
<thead>
<tr>
<th>Period</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flow Rs.</td>
<td>−1,00,000</td>
<td>30,000</td>
<td>30,000</td>
<td>30,000</td>
<td>30,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>
14. (a) A firm is considering replacement of an equipment, whose first cost is Rs. 1,750 and the scrap value is negligible at any year. Based on experience, it was found that the maintenance cost is zero during the first year and it increases by Rs. 100 every year thereafter.

(i) When should the equipment be replaced if $i = 0\%$
(ii) When should the equipment be replaced if $i = 12\%$

Or

(b) Discuss the reasons for replacement and the different types of maintenance and distinguish between breakdown and preventive maintenance.

15. (a) The Beta Drug Company has just purchased a capsulation machine for Rs. 20,00,000. The plant engineer estimates that the machine has a useful life of five years and a salvage value of Rs. 25,000 at the end of its useful life. Compute the depreciation schedule for the machine by each of the following depreciation methods.

(i) Straight line method of depreciation
(ii) Sum-of-the-years digits method of depreciation
(iii) Double declining balance method of depreciation.

Or

(b) A company has purchased a bus for its officers for Rs. 10,00,000 the expected life of the bus is eight years. The salvage value of the bus at the end of its life is Rs. 1,50,000. Find the following using the sinking fund method of depreciation:

(i) Depreciation at the end of the third year and fifth year
(ii) Book value at the end of the second year and sixth year.