Total No. of Page- 04
End-Semester Examination
Fourth Semester

Roll No. ------------
May. 2019
B.Tech

HU-202- Engineering Economics

Marks - 50 Marks   Time- 3 Hrs.

> **Attempt any five questions. Assume missing value, if any.**

1.a Discuss Price elasticity and Cross elasticity of Demand and   4
their significance in taking Business decision.

1.b Following are the demand functions for two commodities x_1 2+1=3
and x_2:

$$x_1 = p_1^{-1.7}p_2^{0.8}$$
$$x_2 = p_1^{0.5}p_2^{-0.2}$$

Determine whether the commodities are 'complementary' or
'competitive'.

1.c If the demand law is X= 20/(p+1). Calculate Price Elasticity   3
of Demand at the point where p=3.

2.a What do you mean by Tax and how it can be used for   2+2=4
development of green infrastructure? Discuss.

2.b In the design of a jet engine part, the designer has a choice   3
of specifying either   an aluminum alloy casting or a steel
casting. Either material will provide equal service, but the
aluminum casting will weigh 1.2 Kg. as compared with 1.35
Kg. for steel casting. The aluminum can be cost Rs. 80.00
per Kg. and the steel one for Rs. 35.00 per Kg. The cost of
machining per unit is Rs. 150.00 for aluminum and Rs.
170.00 for steel. Every Kilogram of excess weight is
associated with a penalty of Rs. 1300 due to increased fuel
consumption. Which material should be specified and what
is the economic advantage of the selection per unit?

2.c The chief engineer of refinery operation is not satisfied with 3
the preliminary design for storage tanks to be used as part of
a plant expansion programme. The engineer who submitted
the design was called in and asked o reconsider the overall
dimensions in the light of an article in the "Chemical

Engineer", entitled "How to size future process vessels"?
The original design submitted called for tanks 5.2 m is diameter and 7 m in height. From a graph of the article the engineer found that the present ratio of height to diameter of 1.35 is 111% of the minimum cost and that the minimum cost for a tank was when the ratio of height to diameter was 4:1. The cost for the tank design as originally submitted was estimated to be Rs. 9,00,000. What are the optimum tank dimensions if the volume remains the same as the original design? What total savings may be expected through the redesign?

3.a Explain the difference between labour intensive and capital intensive technology. What kind of technology would be more suitable for the Indian economy? **4**

3.b The production function of a commodity is given by **3x2=6**
$$Q = 40F + 3F^2 - F^3/3$$
Where Q is the total output and F is the unit of inputs.
(i) Find the number of units of input required to give maximum output.
(ii) Find the maximum value of marginal product.

4.a You are CEO of a company. Discuss factors which you will consider while deciding location of your firm abroad. **4**

4.b A person plans to save Rs. 15, 000 from the next year for next 15 years for his son's education. The bank gives 12 % interest rate, compounded annually. What sum of money he will receive after 15 years. **3**

4.c What amount of money saved today will yield Rs. 40,000/- in third year and Rs. 55,000/- after five year at the 12% rate of interest compounded annually? **3**

5.a What do you mean by Inflation? How it can be controlled by fiscal policy? **4**

5.b A company invests in one of the two mutually exclusive alternatives. The life of both alternatives is 12 years with following investment annual returns and salvage value. **6**

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Page 2 of 4
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	Alternatives	
	A	B
In vestment	830000	745000
Annual Equal return	310000	270000
Salvage value	150000	210000

Determine the best alternative based on the annual equivalent method by assuming= 10%.

6.a What do you mean by Sustainable Development? Discuss efforts of a Professional engineer of your branch to achieve it. **4**

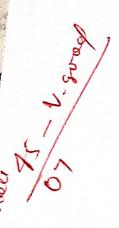6.b Prepare the cost sheet for the enterprise XYZ from following: **6**

Particular	Rs.
Raw material- Existing Stock	7,000.00
Purchase	15,000.00
Closing stock	5,000.00
Direct Wages	25,000.00
Direct expenses	15,000.00
Factory rent, insurance, lighting, supervision	35,000.00
Cost of plant and machinery	12,000.00
Indirect wages	20,000.00
Advertisement, publicity, free sample	2,000.00
travelling expenses of Salesman	2,000.00
Salary of office staff	10,000.00
Telephone and postage	2,000.00
Audit fee	4,000.00
Profit	10% of total cost

7.a Discuss factors which should be considered while launching a new commodity in the market. **4**

(handwritten notes)
6(b) Pc = 57000
Fc = 1,24,000
cost = 1,40,000
Production TC = 1,44 000

Page 3 of 4

profit
S = 158400
M = 14 400

7.b Firm XYZ entertainment has arranged to buy some 6 recording equipment. It estimates that the equipment will have five years useful life and no salvage value at the end of equipment life. The dealer has offered the Firm XYZ entertainment two alternative ways to pay for the equipment,

(a) Pay Rs. 60,000 immediately and Rs. 15,000 at the end of one year.

(b) Pay nothing until the end of fourth year when a single payment of Rs. 90,000 must be made

If 12 percent is the interest rate compounded annually, which alternative should be opted by the Firm XYZ entertainment?

----**End**----

7 (b)   73392   129342

57196.62   100180

14678

11967

$$r \cdot \frac{P_2}{P_1}$$