Gokhale Institute of Politics and Economics, Pune – 411 004
(Deemed to be University u/s 3 of the UGC Act, 1956)

Model Questions for Entrance Examination for Ph.D. Programme

Section A

1 On the eve of the departure of the British, on 14 August 1947, Jawaharlal Nehru declared: 'Long years ago we made a tryst with destiny, and now the time comes when we shall redeem our pledge'. 'The achievement we celebrate today', Nehru went on, 'is but a step, an opening of opportunity, to the great triumphs and achievements that await us.' He reminded the country that the task ahead included 'the ending of poverty and ignorance and disease and inequality of opportunity.'

(Dreze and Sen, *India: Economic Development and Social Opportunity*, 1995:1)

Read the passage above carefully and choose the correct answers to the following questions:

i) What achievement was being celebrated by Nehru and others?
   a) eradication of poverty in India;
   b) social equality of opportunity;
   c) independence from the British rule;
   d) fulfillment of long-standing pledge

ii) What were the triumphs and achievements that awaited us on the day of independence?
   a) nuclear bomb;
   b) total literacy and social equality;
   c) victory in war with neighbourng nations;
   d) having Indians amongst the top richest corporate houses of the world

2. Hot : Scalding as

a) Cold: Freezing

b) Cold: Lukewarm

c) Cold: Warm

d) None of the above

3 4:16 as 16:

a) 256

b) 32

c) 48

d) 16

e) None of the above

4 Complete the sequence a, c, f, j ,

a) o

b) n

c) p

d) D

5. What is the next number in the sequence 8 13 5 15 20 12 ?

a. 17
b. 15
c. 36
d. None of the above
e.

Section B

1. Where a tax can be shifted the incidence depends on

a) how many producers there are

b) who is legally obliged to pay the tax

c) elasticities of demand and supply

d) whether there is perfect or imperfect information

2. The models used for planning in India are based on the idea of

a) Mahatma Gandhi

b) Manavendra Nath Roy

c) J. R. D. Tata

d) P. C. Mahalanobis

3. L-Shaped indifference curves arise when

a) Commodities are unrelated to one another

b) Commodities are perfect substitutes of one another

c) When one commodity is a necessity and the other a luxury

d) Commodities are perfect complements of one another

4 The production function $Q = AL^{\alpha}K^{\beta}$ obeys constant returns to scale if

a) $\alpha+\beta=1$

b) $\alpha+\beta=0$

c) $\alpha+\beta=-1$

d) none of the above

5 . You are an analyst for a metropolitan transportation authority. You are asked if it would improve efficiency to buy more buses, and if so, how many more should be bought. The operating cost of a bus is 30 during the day and 60 during the night, when higher wages must be paid to drivers and other workers. The daily capital cost of a bus, whether or not it is used, is 10. The demand for buses aggregated over persons and stops during the 12 hours of day and night, respectively D and N, are

$$Q_D = 160 - P_D$$

$$Q_N = 80 - P_N$$

What prices should be charged to induce efficient ridership?

a) $P_D = 45, \quad P_N = 55$

b) $P_D = 40, \quad P_N = 60$

c) $P_D = 70, \quad P_N = 80$

d) $P_D = 60, \quad P_N = 40$

Section C

1 Two trains start from P and Q and travel towards one another at speeds of 50 kmph and 40 kmph respectively. By the time they meet, the first train travelled 100 km more than the second train. What is the distance between P and Q?

a) 500 km

b) 630 km

c) 660 km

d) 900 km

2 What is the derivative of $6x^3$ with respect to x?
(A) 0
(B) 12x
(C) $18x^2$
(D) 18x
(E) $18x^3$

3 What is the value of e^0?
(A) 0
(B) 1
(C) e
(D) 2
(E) None of the above.

4 If random variable X has probability density function given by

$f(x) = e^{-x} \quad x > 0$

$= 0 \quad$ Otherwise

Find P [2x + 3 = 5]

a) 1/2

b) 1/4

c) 0

d) 1

5 What is the rank of the matrix?

$$\begin{bmatrix} 1 & 2 & 1 & 2 \\ 4 & 4 & 0 & 0 \\ 3 & 6 & 0 & 0 \\ 2 & 4 & 2 & 4 \end{bmatrix}$$

a. 0
b. 3
c. 1
d. 2

6 What is the fourth term of (2a - 6b)^8?

a. 28*16*1296
b. 28*32*216
c. 70*32*216
d. 56*32*216

8 What is the sum of the below series?

$$\sum_{n=1}^{\infty}\left(\frac{1}{2^n}+\frac{1}{3^n}\right)$$

and

$$\sum_{n=1}^{\infty}\left(7\frac{1}{3^n}-4\frac{1}{2^n}\right)$$

a. 3/2 and –1/2
b. 2/3 and 5/2
c. 2/3 and 1/2
d. 3/2 and 5

9 What is the value of $\log_4 16$?

a. 4
b. 2
c. 8
d. 1

10 On which of the following interval(s) must the function $f(x) = 2+x^2 -x^3$ have a root?

a. [−1, 0]
b. [0, 1]
c. [1, 2]
d. [2, 3]

11 What will be the limits of the following?

(a) $\lim_{x\to 1} \frac{x}{x+1} + \cos(\Pi x)$

(b) $\lim_{h\to 0} \frac{[1/(x+h)] - [1/x]}{h}$

(c) $\lim_{x\to \infty} \frac{\sqrt{x} - 1}{\sqrt{x} + x + 3}$

12 Find the number of ways in which two books on economics and three books on accountancy can be arranged in a line.

a. 60
b. 120
c. 24
d. 40

13 Four Indian and three American students have to stand in a row for a photograph. If they choose their position at a random. What is the probability that Americans are at extremes.7

a. 4/35
b. 2/7
c. 2/9

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