ECO

C 81001 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2020

Economics

ECO 4B 05—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II

Time : Three Hours Maximum : 80 Marks

Use of Calculator is permitted.

Part A

Answer **all** *questions.*

1. $\lim_{x \to 3} \frac{x^2 - 9}{x - 3} =$ _____.

   (i) 6. (ii) 4.

   (iii) 2. (iv) 0.

2. The derivative of 3 with respect to x is _____.

   (i) Zero. (ii) 1.

   (iii) $3x$. (iv) None of these.

3. If demand function is $20 - 3p + p^2$, then marginal function is _____.

   (i) $p - 3$. (ii) $2p - 3$.

   (iii) p^2. (iv) $3p - 3$.

4. First derivative of x^n with respect to x is _____.

   (i) nx^n. (ii) $(n-1)x^n$.

   (iii) nx^{n-1}. (iv) None of these.

5. The weights assigned in Laspeyre's price index number are _____.

   (i) Current year price. (ii) Base year price.

   (iii) Current year quantity. (iv) Base year quantity.

Turn over

6. Dorbish-Bowley Price Index is the———————— of Laspeyre's and Paasche's index.

(i) AM. (ii) GM.

(iii) HM. (iv) None of these.

7. ———————— is the ideal index number.

(i) Laspeyre's (ii) Paasche's.

(iii) Fisher's. (iv) None of these.

8. Cost of living index number is ———————— index.

(i) Laspeyre's (ii) Paasche's.

(iii) Fisher's. (iv) None of these.

9. (Total live births / Total deaths) is ————————.

(i) Crude birth rate. (ii) Crude death rate.

(iii) Vital index. (iv) None of these.

10. $P\left(A^C \cap B\right) =$ ————————.

(i) $P(A) - P(B)$. (ii) $P(B) - P(A \cap B)$.

(iii) $P(B) - P(A)$. (iv) None of these.

11. If A and B are disjoint $P(A \cup B) =$ ————————.

(i) $P(A) - P(B)$. (ii) $P(B) - P(A)$.

(iii) $P(A) + P(B)$. (iv) $P(B) - P(A \cap B)$.

12. $P(A) = 0.5$, $P(B) = 0.4$, if A and B are independent, $P(A \cap B) =$ ————————.

(i) 0.20. (ii) 0.90.

(iii) 1.10. (iv) None of these.

(12 × ½ = 6 marks)

Part B (Very Short Answer Questions)

Answer any **ten** *questions.*

13. Find the derivative of $\left(x^2-9\right)\left(x^2+9\right)$ with respect to x.

14. Define Marginal Cost.

15. For a demand function $Q = 120 - 10P$, find elasticity of demand.

16. Define Index Numbers.

17. Define Quantity Index Number.

18. Define Paasche's index number.

19. Define Crude Death Rate.

20. Define General fertility rate.

21. Define Sample space.

22. Find $P(A \cap B)$, if $P(A \cup B) = 0.6, P(A) = P(B) = 0.4$.

23. Define conditional probability.

24. A box contains 3 white and 5 black balls, 3 balls are drawn. Find the probability that they are one white and 2 black balls.

(10 × 2 = 20 marks)

Part C (Short Essay Questions)

Answer any **six** *questions.*

25. If $y = x \log x$, show that $x^2 \frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = 0$.

26. Explain marginal revenue, marginal productivity and marginal utility.

27. Explain the uses of index numbers.

28. Explain Laspeyre's and Paache's quantity index numbers.

29. Calculate age specific death rate for the following population :

Age	:	0–10	11–24	25– 40	41 and over
Population	:	1800	4500	7000	800
No. of deaths	:	30	20	25	15

30. Explain age specific fertility rate and total fertility rate.

31. Define random experiment. Write down the sample space of the random experiment of tossing of three unbiased coins.

32. Given $P(A) = 0.6,\ P(B) = 0.4, P(A \cup B) = 0.7$. Find (i) $P(A/B)$; (ii) $P\left(A/B^C\right)$; (iii) $P\left(A^C/B^C\right)$.

(6 × 5 = 30 marks)

Part D (Essay Questions)

Answer any **two** *questions.*

33. Determine the maximum and minimum value of the function $f(x) = x^3 - 6x^2 + 9x - 5$.

34. Calculate (i) Laspeyre's index number ; (ii) Paasche's index number using the following data :

Commodity	2004		2008	
	Price (p_0)	Quantity (q_0)	Price (p_1)	Quantity (q_1)
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

35. Calculate crude death rate and standardized death rate using the following data :

Age	:	0-10	11-24	25-40	41-60	61 and over
Population	:	21000	30000	37000	17000	5000
No. of deaths	:	350	102	229	354	415
Std. age distribution/1000		221	298	285	149	47

36. An insurance company insured 3000 scooter drivers, 2000 car drivers and 5000 truck drivers. The probability of accident by the drivers of these types of vehicles is 0.04, 0.02 and 0.03 respectively. One of the insured people meets an accident. What is the probability that he is a truck driver ?

(2 × 12 = 24 marks)