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M.A. ENTRANCE EXAMINATION, 1997

ECONOMICS

Time Allowed : 3 Hours *Maximum Marks : 100*

SECTION—I

1. *The Discovery of India* was written by
   (a) M. K. Gandhi
   (b) Jawaharlal Nehru
   (c) Vallabhbhai Patel
   (d) Mark Tully
   (e) V. S. Naipaul

2. The proportion of population living below the poverty line in India is currently estimated to be around
   (a) one-tenth
   (b) one-third
   (c) one-half
   (d) two-thirds
   (e) three-fourths

3. Total consumption in an economy is given by $C=1000+0{\cdot}6Y$ where Y denotes total income. Total income equals the sum of consumption and investment expenditure. If investment is 10,000 then income is
   (a) 20,000
   (b) 20,500
   (c) 27,500
   (d) 80,000
   (e) impossible to calculate from this data

4. The function $x^2(1-x)^2$ attains its maximum at
   (a) $x = \frac{1}{2}$
   (b) $x = 1$
   (c) $x = 2$
   (d) None of the above

5. A cylinder has a base of circumference π cm and a volume of 8π cm^3. Its height is
   (a) 4 cm
   (b) 8 cm
   (c) 32 cm
   (d) 4π cm
   (e) None of the above

30 11

57

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6. We have the following data for a country :

GDP at market prices	=	Rs 20,000 crore
Gross Domestic Capital Formation	=	Rs 5,000 crore
Depreciation	=	Rs 3,000 crore
Exports	=	Rs 3,000 crore
Imports	=	Rs 6,000 crore
Net invisible earnings from abroad	=	Rs 2,000 crore
Indirect taxes less subsidies	=	Rs 2,000 crore

Then, the Net Domestic Product at factor cost is

(a) Rs 15,000 crore

(b) Rs 16,000 crore

(c) Rs 17,000 crore

(d) Rs 18,000 crore

(e) Rs 20,000 crore

7. Consider the same country as in Question 6.
The gross savings rate is

(a) 10 per cent

(b) 15 per cent

(c) 20 per cent

(d) 25 per cent

(e) 75 per cent

8. The probability of drawing a red Queen from a pack of cards is

(a) $1/52$

(b) $1/26$

(c) $1/13$

(d) $1/26 \times 1/51$

(e) $1/51 \times 1/51$

9. Suppose X and Y are two positive valued random variables, each taking 10 values. Both have the same mean, but the variance of Y is twice the variance of X. Which of the following holds?

(a) $\max_i (X_i) > \max_i (Y_i)$

(b) $\max_i (X_i) < \max_i (Y_i)$

(c) $\max_i (X_i) = \max_i (Y_i)$

(d) $\min_i (X_i) < \min_i (Y_i)$

(e) None of the above

30 12

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10. Suppose the female wage rate in agriculture is 70% of the male wage rate, but women workers have a 50% higher probability of finding employment than men workers. Then the expected wage income of women workers is

(a) higher than that of the men

(b) lower than that of the men

(c) the same as that of the men

(d) Cannot say

11. Over a ten-year period, the population of a country increased at the annual rate of 2%, nominal GDP grew at 5% and inflation per annum was 10%. The per capita real GDP of the country

(a) remained the same

(b) increased

(c) decreased

(d) Cannot say

12. Suppose a country receives a large net inflow of portfolio capital from abroad, but there is no change in other capital transactions or in current account transactions on the external account. As a result, the level of foreign exchange reserves will

(a) increase

(b) decrease

(c) remain the same

(d) Cannot say

13. In an economy the capital stock of Rs 6,000 produces an annual output stream of Rs 1,500. The capital-output ratio is

(a) 4

(b) ¼

(c) 4 years

(d) 4 per year

(e) None of the above

14. The function $f(x)$ is defined as

$f(x) = 1$ if x is rational

$f(x) = 0$ if x is rational

Then $f(x)$ is

(a) continuous everywhere

(b) continuous only at x rational

(c) continuous only at x irrational

(d) nowhere continuous

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15. Define $|x| = x$ if $x > 0$
$= -x$ if $x < 0$

Then $|x| \leq a$ implies

(a) $-a \geq x \geq a$

(b) $-a \leq x \leq a$

(c) $x \leq a$

(d) None of the above

16. Indifference curves of a consumer do not intersect because

(a) marginal rates of substitution are assumed to be diminishing

(b) more is assumed to be preferred to less

(c) budget lines have to be tangential to indifference curves

(d) different indifference curves are assumed to measure different levels of utility

(e) All of the above

SECTION—II

17. We have the following data for two countries which each produces food and cloth using only labour :

	Labour hours required to produce one unit of	
	Food	*Cloth*
Country A	80	90
Country B	120	100

(a) Can these countries gain from trading with each other? Why?

(b) Which country will export food?

(c) Which country will export cloth?

18. An economy produces output $Q = AL^{\alpha}$ by applying labour (L) to a fixed amount of land. A and α are constants, and $\alpha = 0.5$.

(a) Are there diminishing returns to the application of labour?

(b) If wages are equal to the marginal product of labour, what is the share of rent in output when employment is 100?

(c) What is the marginal product of labour when output is 200 and employment is 50?

19. By working through the multiplier process, derive the level of aggregate demand in a closed economy where A is the level of autonomous demand and c is the propensity to consume. What happens if $c > 1$?

20. Consider the function $f(x) = \log x - x + 1$ and let k be a constant. How many values of x will satisfy the equation

$$f(x) = k$$

if (i) $k > 0$,

(ii) $k = 0$,

(iii) $k < 0$?

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21. Let $S = 4p + p^2$ be the supply of a good when p is the price. Let $D = 10 - 5p$ be the demand for the same good at price p. Equilibrium is said to exist when there exists a *positive* p, such that $S = D$. Calculate p, S and D at the equilibrium.

Such an equilibrium is said to be stable if at equilibrium values $\frac{\partial D}{\partial p} - \frac{\partial S}{\partial p} < 0$.

Check whether the equilibrium you have obtained is stable.

22. Two players A and B have Rs 2 and Re 1 respectively. They play a game using tosses of a fair coin such that B pays A Re 1 when a head appears and A pays B Re 1 when a tail appears. The game stops when one of the players loses all her money. What is the probability that the game ends on an odd-numbered toss with A losing all her money? Explain your answer.

23. A consumer is assumed to maximise his utility function of the form $u(x, y)$ where x and y are two goods consumed, subject to the constraint that the cost of the goods consumed does not exceed his income. Let the price of both x and y be Re 1 per unit; let the consumer's income be Rs 100; and let his utility function be $u(x, y) = 5x + 7y$. How much of x and y will the consumer consume?

24. In a society, each couple can have at most two children. Each couple stops having children once they have a son. What is the expected proportion of females in the total population of this society?

25. In 1990, workers obtained a wage of Rs 1,000 and were observed to spend 40% of this on food, 30% on clothing and 30% on other items. By 1996, the money wage was Rs 1,500, but during the intervening period food prices increased by 100%, cloth prices by 50% and prices of other items by 10%.

    (a) What was the percentage change in real wages?

    (b) If in 1996, workers are found consuming food, cloth and other items in the ratio 30 : 20 : 50, could they have afforded this same consumption bundle in 1990?

26. The demand curve faced by a monopolist whose production costs are zero, is the following :

$$Q = 10 - p \quad \text{when } p > 5$$
$$= 30 - p^2 \quad \text{when } p \leq 5$$

where Q is quantity and p is price.

What choice of Q will maximise the monopolist's profit, and what will be the corresponding value of p?

SECTION—III

27. Four persons A, B, C and D have to share Rs 4 among themselves in units of one rupee. First A proposes a distribution and all of them, including A, vote on it. If at least 50% of those voting agree with A, the proposal is accepted. If not, A loses her voting rights and B gets to propose a distribution and all except A vote on it. Once again, B's proposal is accepted if at least 50% of those eligible to vote agree on it. If not, B also loses her voting rights and C gets to propose, and so on to D.

    Assume that each person prefers more money to less, and will always vote against a distribution in which she gets zero. What distribution should A propose in the beginning? Explain your answer.

30 15

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28. Below are 3 sets of 4 statements each. The number of true statements in any set is different from the number of true statements in any other set. A crime has been committed by one of the individuals *X*, *Y*, or *Z*. By indicating true or false against each statement, determine who has committed the crime.

Set—A

(*a*) There is a real number such that $|x + 1| = |x| + 1$

(*b*) The set $(A \cap B) \cup C$ is the same as $(A \cup C) \cap (B \cup C)$

(*c*) For $x > 1$, $x > \log x$.

(*d*) *X* has committed the crime.

Set—B

(*a*) If a is a rational number and b is an irrational number, then $(a + b)$ is an irrational number.

(*b*) Even if $f(x) < a$ and $f(y) > a$, there need not exist z such that $f(z) = a$

(*c*) If GDP per capita in country *A* is higher than in country *B*, then everyone in *A* is better off than everyone in *B*.

(*d*) *Y* has committed the crime.

Set—C

(*a*) There is no real number which satisfies the equation $x^4 + 2x^2 + 1 = 0$.

(*b*) If $f(x)$ is maximised at x^*, then $[f(x)]^2$ must also be maximised at x^*.

(*c*) The sum of an infinite set of positive numbers must be infinite.

(*d*) *Z* has committed the crime.

SECTION—IV

29. Attempt any *one* of the following questions in the space provided. Try to keep your answer within *500* words in length :

(*a*) Is there an economic case for land reforms in India today?

(*b*) Is a policy of caste-based job reservations an effective way of furthering social equity? Why?

(*c*) Will the reduction of import restrictions improve the efficiency of Indian industry? Why?

(*d*) What are the arguments for and against 'targeting' in a public distribution system for food?

(*e*) 'Ethical judgements can only be made under conditions of ignorance.' Discuss.

(*f*) What is the case for a policy of prohibition of alcohol? What could be the economic consequences?

(*g*) 'A country like India cannot afford basic science research.' Discuss.

(*h*) What is involuntary unemployment? Can it persist in a capitalist country even if employers have complete freedom to hire and fire workers?

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