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ENTRANCE EXAMINATION, 2018

M.A. ECONOMICS

[Field of Study Code : ECOM (216)]

Time Allowed : 3 hours

Maximum Marks : 100

INSTRUCTIONS FOR CANDIDATES

(i) Answer all questions.

(ii) This Question Paper consists of *two* Sections—Sections A and B.

(iii) Each question of Section—A carries 1 mark. Answer all the 40 questions in Section—A in the OMR Sheet (see the separate instruction).

(iv) Questions of Section—B have to be answered in the space given in the Question Paper.

(v) Question Nos. **41** to **49** carry 5 marks each and Question No. **50** carries 15 marks.

(vi) Extra pages are provided for Rough Work at the end of the booklet.

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ENTRANCE EXAMINATION, 2018

M.A. ECONOMICS

SUBJECT . . . . . .
(Field of Study/Language)

FIELD OF STUDY CODE . . . . . .

NAME OF THE CANDIDATE . . . . . .

. . . . . .

REGISTRATION NO.

CENTRE OF EXAMINATION . . . . . .

. . . . . .

DATE. . . . . .

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(Signature of Candidate)

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(Signature of Invigilator)

.....
(Signature and Seal of Presiding Officer)

/30-A

SECTION—A

Question Nos. **1–40** carry *1* mark each. For each wrong answer, *1/4* mark will be deducted

1. Okun's Law states that the percentage change in real GDP is proportional to

(a) change in the unemployment rate

(b) change in the consumer price inflation rate

(c) change in the wholesale price inflation rate

(d) change in the investment rate

2. In July 2017, Aamir bought a one-year-old house in Mumbai for ₹ 50 crores. Which of the following statements is true?

(a) The purchase price of the house is accounted for in the nominal GDP for 2017–18

(b) The purchase price of the house is accounted for in the aggregate investment expenditure for 2017–18

(c) The purchase price of the house is accounted for in the aggregate consumption expenditure for 2017–18

(d) None of the above

3. A real estate company begins construction of a commercial building in July 2015 for the building. It completes the building in FY 2016–17 but, is able to sell it only in FY 2017–18. Which of the following statements is true?

(a) A part or whole of the cost of construction of the building is accounted for on the expenditure side of the national accounts only in the year 2016–17

(b) A part or whole of the cost of construction of the building is accounted for on the expenditure side of the national accounts only in the years 2015–16 and 2016–17

(c) A part or whole of the cost of construction of the building is accounted for on the expenditure side of the national accounts only in the year 2017–18

(d) A part or whole of the cost of construction of the building is accounted for on the expenditure side of the national accounts in the years 2015–16, 2016–17 and 2017–18

4. What is the maximum value which can be attained by the ratio of the employment rate to the unemployment rate in an economy?

(a) There is no maximum value for the ratio

(b) 40

(c) 20

(d) 2

5. A Cobb-Douglas production function with inputs capital and labor is homogeneous of degree 1 and has output elasticity of capital equal to 0·4. If the marginal product of labor is 15 at a value of the capital-labor ratio equal to 20, what is the average product of labor at the same value of the capital-labor ratio? 9.

(a) 37·5

(b) 100/3

(c) 25

(d) 50

6. Suppose the stock of money in the economy is growing faster than aggregate nominal income in an economy. Which of the following statements is necessarily true? 1

(a) The rate of inflation must be higher than the rate of growth of real output

(b) The income velocity of money must be decreasing

(c) The stock of real balances must be increasing

(d) The economy is suffering from a deficiency of effective demand

7. The Solow growth model implies that, if the labor force of a country is a constant fraction of its population, *ceteris paribus*

(a) an increase in the growth rate of the labor force has a positive effect on the growth rate of per capita income in the long run

(b) an increase in the growth rate of the labor force has a negative effect on the growth rate of per capita income in the long run

(c) an increase in the growth rate of the labor force has no effect on the growth rate of per capita income in the long run

(d) an increase in the growth rate of the labor force sometimes has a positive effect and sometimes a negative effect on the growth rate of per capita income in the long run

8. What is the main instrument of monetary policy used by the Reserve Bank of India?

(a) CRR

(b) Quantity of Non-Borrowed Reserves

(c) SLR

(d) Repo Rate

9. Consider the IS-LM model. Suppose the LM curve is positively sloped. Planned investment expenditure is exogenously given. Saving is simply an increasing function of aggregate income. There always exists a level of income at which saving is equal to investment. Assume that there is no government expenditure and net exports are zero. Which of the following statements is necessarily true?

(a) The IS curve for the economy is a horizontal straight line

(b) Changes in the quantity of money have no effect on the equilibrium level of income

(c) Changes in autonomous expenditures have no effect on the equilibrium interest rate

(d) None of the above

10. The theoretical result that once-for-all changes in the supply of money in an economy affect nominal variables but, do not have any effect on real macroeconomic variables including real output is known as

(a) the purchasing power parity doctrine

(b) the neutrality of money

(c) the policy ineffectiveness proposition

(d) the Fisher effect

11. Three random variables y, w and u are linked by the following relationship :

$$y = 2w + 4u$$

It is known that var (w), the variance of w, is 5. It is also known that cov (w, u), the covariance of w and u, is 1. What is the covariance of w and y?

(a) 14

(b) 9

(c) Cannot be computed from the information given

(d) None of the above

12. Random variable X is uniformly distributed on the interval $(-4, 4)$. Let $Y = X^2$. What is the probability that random variable Y has a realization less than 2 ?

(a) $\sqrt{2}/4$

(b) $1/2$

(c) $\sqrt{2}$

(d) 0

13. In a class, there are 5 boys and 5 girls. 4 students are selected at random. The probability that 2 boys and 2 girls are selected is

(a) 0·5

(b) 0·4

(c) 10/21

(d) None of the above

14. A and B are events. $P(A)$, the probability of event A, is strictly greater than 0. $P(B)$, the probability of event B, is strictly greater than 0. $P(A|B)$ is the probability of A given B. $P(B|A)$ is the probability of B given A. It is known that $P(A|B) < P(A)$. Which of the following statements is necessarily true?

(a) $P(B|A) < P(A)$

(b) $P(B|A) < P(B)$

(c) $P(B|A) \geq P(B)$

(d) None of the above

15. A and B are events. A^C is the complement of A. B^C is the complement of B. $P(A)$, the probability of event A, is 0·60. $P(B)$, the probability of event B, is 0·3. Also, $P(A \cup B)$, the probability of event $A \cup B$, is 0·75. Which of the following statements is true?

(a) $P(A \cap B) = 0 \cdot 25$

(b) $P(A^C \cap B^C) = 0 \cdot 25$

(c) $P(A^C \cup B^C) = 0 \cdot 25$

(d) None of the above

16. The domain of $f(x) = 2 \times \log |x - 2|$ is given by the interval

(a) $(-\infty, 2) \cup (2, +\infty)$

(b) $(-2, +\infty)$

(c) $[2, +\infty)$

(d) $(-\infty, +\infty)$

17. Suppose x and y are positive integers with $x > y$. Now suppose $3x + 2y$ and $2x + 3y$ when divided by 5, leave remainders 3 and 2 respectively. It follows that when $x - y$ is divided by 5, the remainder necessarily equals

(a) 1

(b) 2

(c) 3

(d) 4

18. For $n > 1$, consider the following two numbers :

(i) $\left[\frac{n+7}{3} + \frac{n-3}{4}\right]$

(ii) $\left[\frac{7n+19}{7}\right]$

State which one of the following statements is true.

(a) *(i)* is greater than *(ii)*

(b) *(i)* is less than *(ii)*

(c) *(i)* is equal to *(ii)*

(d) The relationship between *(i)* and *(ii)* cannot be determined from the information given

19. V can take any value (positive, negative or zero). U is a function of V. Which of the following functions is/are monotonic transformation(s) of V?

(i) $u = 2v - 13$

(ii) $u = e^{-v} + v^2$

(iii) $u = v^2$

(a) *(i)*, *(ii)* and *(iii)*

(b) *(i)* only

(c) *(ii)* only

(d) *(iii)* only

20. A student studying the weather for x days observed that *(i)* it rained on 7 days, morning or afternoon; *(ii)* when it rained in the afternoon, it was clear in the morning; *(iii)* there were five clear afternoons; and *(iv)* there were six clear mornings. Then x equals

(a) 7

(b) 11

(c) 10

(d) 9

Answer Question Nos. **21**, **22** and **23** on the basis of the following :

A random variable X has the following probability density function :

$$f(x) = e^{-x} \text{ for } 0 < x < \infty$$
$$f(x) = 0 \text{ for } x \leq 0$$

21. Probability $(X > 1)$ is equal to

(a) $1/e$

(b) $1 - 1/e$

(c) e^{-2}

(d) None of the above

22. Probability $(1 < X < 2)$ is equal to

(a) $1/e$

(b) $1 - 1/e$

(c) $(1/e) \times (1 - 1/e)$

(d) None of the above

23. The mean of X is equal to

(a) $1/e$

(b) 1

(c) e

(d) None of the above

24. Let $y = f(x)$, where $x \in [a, b]$ and $b > a$, be a continuously differentiable function. Suppose $f(x)$ attains maximum at $x = x^*$. Then it is always true that

(a) $f'(x^*) = 0$

(b) $f''(x^*) < 0$

(c) $f'(x^*) = 0$ and $f''(x^*) < 0$

(d) Cannot say

25. Four statements are given below regarding elements and subsets of the following set :

$$S = \{1, 2, \{1, 2, 3\}\}$$

Only one of these statements is correct. Which one is it?

(a) $\{1, 2\} \in S$

(b) $\{1, 2\} \subseteq S$

(c) $\{1, 2, 3\} \subseteq S$

(d) $3 \in S$

26. Let $x_1, x_2, \cdots, x_{100}$ be positive integers such that $x_i + x_{i+1} = k$ for all i and k is a constant. If $x_{10} = 1$, then the value of x_1 is

(a) k

(b) $k - 1$

(c) $k + 1$

(d) 1

27. A salesman sold two pipes at ₹ 12 each. His profit on one was 20% and the loss on the other was 20%. Then on the whole, he

(a) lost ₹ 1

(b) gained ₹ 1

(c) neither gained nor lost

(d) lost ₹ 2

28. If the short-run average cost curve for a firm is a decreasing function of its output over a certain range, then in that range we must have

(a) the firm's marginal cost curve must also be decreasing

(b) the marginal cost curve will lie below the average cost curve, assuming that output is plotted on the horizontal axis and the costs are on the vertical axis

(c) the location of the marginal cost curve is uncertain since it depends on whether the firm is a competitive one or not

(d) the marginal cost curve will lie above the average cost curve, assuming that output is plotted on the horizontal axis and the costs are on the vertical axis

29. Let $S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \cdots$. Then S is equal to

(a) 2

(b) 4

(c) 6

(d) The sum does not converge to any finite value

30. What is the probability of a 4 turning up at least once in two tosses of a fair die?

(a) 11/36

(b) 1/9

(c) 1/12

(d) 1/4

31. A cake has to be distributed between two persons *A* and *B*. Among the following, which one is ***not*** an efficient distribution of the cake (under the standard assumption that 'more is better' for any person)?

(a) *A* gets the whole cake

(b) *B* gets the whole cake

(c) *A* gets 0·45 and *B* gets 0·55 portion of the cake

(d) *A* gets 0·45 and *B* gets 0·45 portion of the cake

32. In an election, 10% of the voters on the voters' list did not cast their votes and 60 voters cast their ballot papers blank. There were only two candidates. The winner was supported by 47% of all voters in the list and he got 308 votes more than his rival. The number of voters on the list was

(a) 3600

(b) 6200

(c) 4575

(d) 6028

33. A, B and C are three commodities. A packet containing 5 pieces of A, 3 of B and 7 of C costs ₹ 42. A packet containing 2, 1 and 3 of A, B and C respectively, costs ₹ 17. The cost of a packet containing 16, 9 and 23 items of A, B and C respectively, is

(a) ₹ 55

(b) ₹ 75

(c) ₹ 135

(d) Cannot be determined from the above information

34. A worker suffers a 20% cut in wages. He regains his original pay by obtaining a raise of

(a) 20%

(b) 22·25%

(c) 25%

(d) Cannot be determined from the above information

35. S is the set whose elements are zero and all even integers, positive and negative. Consider the five operations *(i)* addition; *(ii)* subtraction; *(iii)* multiplication; *(iv)* division; and *(v)* finding the arithmetic mean. Which of these operations when applied to any pair of elements of S, yield only elements of S?

(a) *(i), (ii), (iii), (iv)*

(b) *(i), (ii), (iii), (v)*

(c) *(i), (iii), (iv)*

(d) *(i), (ii), (iii)*

Answer Question Nos. **36**, **37** and **38** on the basis of the following :

In an economy, the agriculture, industrial and services sectors have initial shares of 50, 20 and 30 percent respectively in the total GDP. They also subsequently grow at the following constant annual rates for the next 60 years : Agriculture—2 percent; Industry—5 percent; and Services—6 percent per annum respectively.

36. Then the annual growth rate of the economy's aggregate GDP over the sixty years will be

(a) constant from year to year

(b) fluctuating from year to year

(c) increasing steadily every year

(d) coming down steadily every year

37. The industrial sector's share in GDP over the sixty years

(a) will keep on increasing every year

(b) will increase for the first twenty years and then start declining

(c) will certainly increase for the first forty years though start declining soon after

(d) will remain constant

38. Starting from the base year, when will the services sector's share in GDP exceed that of agriculture?

(a) Within the first 15 years

(b) Not before 15 years but not later than 25 years

(c) Not before 25 years

(d) Never

39. In an economy tending to produce below its maximum potential output in a year, the government steps up its expenditure by 10 percent but leaves all tax rates unchanged. Which of the following consequences of this would necessarily follow?

(a) The fiscal deficit will necessarily increase by exactly the same amount as the increase in expenditure

(b) If the fiscal deficit was otherwise going to be 5 percent of GDP in the absence of the stepping up of expenditure, it would increase to 5·5 percent

(c) If the government expenditure to GDP ratio was otherwise going to be 25 percent of GDP in the absence of the stepping up of expenditure, it would increase to 27·5 percent

(d) None of the above

40. In an economy with no indirect taxes or subsidies, the gross value added by all production units in a year is ₹ 10,000 crores. ₹ 1,000 crores of this is in foreign owned firms, which repatriate 10 percent of this value added to their home countries. The only other transactions with the rest of the world are exports of ₹ 2,000 crores and imports of ₹ 2,500 crores. Then the GDP at market prices of the economy would be

(a) ₹ 10,000 crores

(b) ₹ 9,000 crores

(c) ₹ 99,000 crores

(d) ₹ 9,500 crores

SECTION—II

Attempt **all** questions

Question Nos. **41–49** carry *5* marks each

Question No. **50** carries *15* marks

41. Suppose in an economy $p_t = p_t^e + 0 \cdot 01 - 0 \cdot 2u_t$ and $p_t^e = 0 \cdot 75 p_{t-1}$, where p_t is the rate of inflation in period t, p_t^e is the expected rate of inflation in period t and u_t is the rate of unemployment in period $t (t = 1, 2, 3, \cdots)$. Suppose in period 1 expectations regarding inflation are realized and the unemployment rate in the economy remains constant from period 1 onwards. Answer the following questions :

(a) What is the value of the inflation rate in period 3 if $p_0 = 0 \cdot 128$?

(b) What happens to the value of the inflation rate as $t \to \infty$?

(c) For what value of the inflation rate in period 0, will the inflation rate in the economy remain constant from period 2 onwards?

42. Consider an economy in which $C = 225 - 10r + 0 \cdot 85(Y - T)$, $I = 1610 - 30r$, $G = 1650$, $X = 1400$, $M = 700 + 0 \cdot 08Y$ and $T = 100 + 0 \cdot 2Y$, where Y : aggregate income, C : aggregate consumption expenditure, I : aggregate investment expenditure, G : government expenditure on goods and services, X : exports, M : imports, T : tax revenues and r : rate of interest (expressed in percent).

(a) What is the slope of the IS curve for this economy?

(b) Assuming that the value of (Y, r) in the economy lies on the IS curve, what is the budget deficit of the government when the rate of interest is 3 percent?

43. Suppose we have a Cobb-Douglas production function given by $f(x, y) = x^{0.5} y^{0.5}$. Evaluate the technical rate of substitution for this production function at $x = y = k$.

44. In a two-good world, a consumer's utility function is given by $U(x, y) = x + y$. Now suppose the price of good x is ₹ 2 and price of good y is also ₹ 2. The consumer has an income of ₹ 100. What are the utility maximizing consumption bundles (if any)? Explain your answer carefully.

45. Let the probability density function of the random variable X be as follows : *(i)* $f(x) = c(4x - 2x^2)$, if $0 < x < 2$ and *(ii)* $f(x) = 0$ otherwise. What is the value of $f(1)$? (Note that your answer should **not** be in terms of c.)

46. Consider a gambling game where you have to throw two fair dice simultaneously. You would gain ₹ 2 for any even number that shows up, and lose ₹ 1 for any odd number that shows up. What is your expected gain or loss from the game?

47. Let $D = a^2 + b^2 + c^2$, where a and b are successive positive integers and $c = ab$. Prove that $\sqrt{D}$ is an odd positive integer.

48. Consider the following optimization problem :

Maximize $f(x, y) = x^2 - y^2$ subject to $g(x, y) = 1 - x - y = 0$

Find solution to this problem (if any).

49. Compute the value of $\int_1^2 (\log x)\,dx$, where $\log x$ is the natural logarithm of x. It is known that $\log 2 \simeq 0 \cdot 693$.

50. Answer any *one* of the following in not more than *500* words :

(a) Does Ricardo's theory of comparative advantage provide an adequate basis for trade liberalization?

(b) How did Raul Prebisch and Hans Singer explain the iniquitous relationship that developing countries faced in world trade and how, in their view, could the developing countries reverse this trend?

(c) What policy options are left for a closed economy stuck in a liquidity trap? Explain.

(d) What shape does the LM curve take when the central bank fixes the interest rate instead of the money supply? How does monetary policy work in such an economy?