Test Centre : _____

Roll No. : _____

Name of the Candidate : _____

S A U

Entrance Test for Ph.D. (Economics) 2017

[PROGRAMME CODE : 50002]

Question Paper Series Code : A

QUESTION PAPER

Time : 3 hours *Maximum Marks* : 100

INSTRUCTIONS FOR CANDIDATES

Candidates must carefully read the following instructions before attempting the Question Paper :

(i) Write your Name, Roll Number and Name of the Test Centre in the space provided for the purpose on the top of this Question Paper and on the OMR/Answer Sheet.

(ii) This Question Paper has two sections : Section—A and Section—B.

(iii) Section—A (objective-type) has 30 questions of **two** marks each. All questions are compulsory.

(iv) **A wrong answer will lead to the deduction of one-fourth (¼) of the marks assigned to that question in Section—A.**

(v) Section—B has 8 long-answer questions out of which any 4 questions are to be answered. Each question carries **ten** marks.

(vi) **Please darken the appropriate circle of 'Question Paper Series Code' and 'Programme Code' on the OMR Sheet in the space provided.**

(vii) Section—A (multiple choice) questions should be answered on the OMR Sheet and answers for Section—B should be written in the Answer Book.

(viii) Answers written inside the Question Paper will **NOT** be evaluated.

(ix) Calculators and Log Tables may be used. Mobile Phones are **NOT** allowed.

(x) A page at the end of the Question Paper has been provided for Rough Work.

(xi) **Return the Question Paper, the OMR Sheet and the Answer Book** to the Invigilator at the end of the Entrance Test.

(xii) **DO NOT FOLD THE OMR SHEET.**

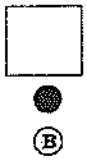
INSTRUCTIONS FOR MARKING ANSWERS ON THE 'OMR SHEET'

Use BLUE/BLACK Ballpoint Pen Only

1. **Please ensure that you have darkened the appropriate circle of 'Question Paper Series Code' and 'Programme Code' on the OMR Sheet in the space provided.**

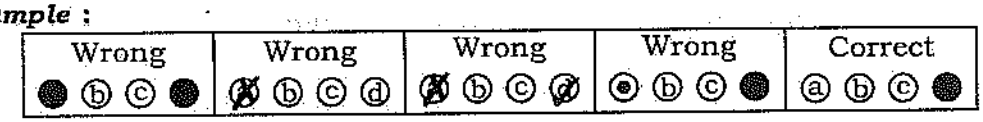
   Question Paper Series Code

   Write Question Paper Series Code **A** or **B** in the box and darken the appropriate circle.

2. Use only Blue/Black Ballpoint Pen to darken the circle. Do not use Pencil to darken the circle for Final Answer.
3. Please darken the whole circle. ●
4. Darken ONLY ONE CIRCLE for each question as shown below in the example :

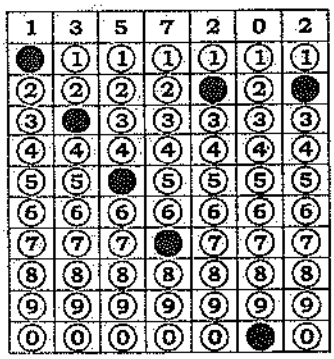
   Example :

5. Once marked, no change in the answer is possible.
6. Please do not make any stray marks on the OMR Sheet.
7. Please do not do any rough work on the OMR Sheet.
8. Mark your answer only in the appropriate circle against the number corresponding to the question.
9. **A wrong answer will lead to the deduction of one-fourth of the marks assigned to that question.**
10. Write your six-digit Roll Number in small boxes provided for the purpose; and also darken the appropriate circle corresponding to respective digits of your Roll Number as shown in the example below.

    Example :

    ROLL NUMBER



SECTION—A

Answer **all** questions

1. Theil entropy index is a measure of
   a. absolute poverty
   b. relative poverty
   c. chronic poverty
   d. multidimensional poverty

2. In classical development theory, if capitalists spend a high share of profit on personal consumption, it will be considered to be
   a. productive expenditure as it maximizes the utility of capitalists
   b. productive expenditure as it acts as an incentive for further expansion
   c. unproductive expenditure as it diverts funds from capital accumulation
   d. unproductive expenditure as it diverts funds from social security provisioning

3. Which country in the South Asian Association for Regional Cooperation (SAARC) has the highest per capita income currently?
   a. India
   b. Pakistan
   c. Maldives
   d. Bhutan

4. The official unemployment rate in rich countries tends to be higher than that in the poorer countries. This phenomenon is explained by
   a. the downward rigidity of wages in rich countries
   b. higher efficiency of labour market in poorer countries
   c. the presence of substantial social safety nets in the rich countries
   d. both a. and c. above

5. The Gini ratio measuring income inequality is 0·30 for the rural sector and 0·40 for the urban sector. If the rural sector accommodates 50 percent of the country's population, the combined Gini ratio for the entire country
   a. is between 0·30 and 0·40
   b. is higher than 0·40
   c. is 0·35
   d. cannot be determined

6. Non-enforcement of private property rights over productive resources may create more employment and income opportunities but may lead to non-optimal use of the resources. In the literature, this idea is referred to as the problem of

a. adverse selection

b. tragedy of commons

c. knife-edge instability

d. external diseconomies

7. A consumer has a utility function $U = x_2 + x_1^{\frac{1}{2}}$ and an income of \$ 50. The price of good x_2 is \$ 1 and the price of good x_1 falls from \$ 2 to \$ 1. The compensating variation (CV) and equivalent variation (EV) for this price change can best be described as

a. CV > EV

b. EV > CV

c. EV = CV

d. CV = EV/2

8. A weak preference relation R is called quasi-transitive iff the strict preference relation P is transitive. Four consumers a, b, c and d have preference relations over a triple x, y, z provided below. Which consumer's preference relation satisfies quasi-transitivity?

a. xPy and yPz and zPx

b. xIy and yIz and xPz

c. xPy and yPz and xIz

d. yPx and zPy and xPz

9. A consumer's utility function is given by $U = \max(x_1, x_2) + \min(x_1, x_2)$. If the price of commodity 1 is \$ 4 and the price of commodity 2 is \$ 8 and the consumer's income is \$ 40, the consumer will attain equilibrium at

a. (5, 0)

b. (10, 0)

c. (4, 3)

d. (2, 4)

10. The production function of a monopolist firm is given by $Q = 10L - 0{\cdot}5L^2$, where L is labour input and Q is output. If the demand curve is $P(Q) = 50 - 0{\cdot}5Q$, what is the marginal revenue product of labour curve?

a. $500 + 150L - 15L^2$

b. $50 - Q$

c. $500 - 150L + 15L^2 - 0{\cdot}5L^3$

d. None of the above

11. Consider a pure exchange economy with two consumers (A and B) and two goods (x and y). If the total stock of x and y is 4 units each and each consumer has a utility function $U = x_i + y_i$, $i = A, B$, the set of Pareto optimal points will be

a. the diagonal of the Edgeworth box

b. the entire Edgeworth box

c. the horizontal axis of the Edgeworth box

d. the vertical axis of the Edgeworth box

12. A risk neutral person who maximizes expected utility would rank two contracts that respectively offer $A = \{90, 150\}$ and $B = \{150, 30\}$ equally if the respective probabilities p_1 and p_2 were

a. equal

b. $p_1 = \frac{1}{3}, \; p_2 = \frac{2}{3}$

c. $p_1 = \frac{2}{3}, \; p_2 = \frac{1}{3}$

d. none of the above

13. Between 2002 and 2003, Afghanistan introduced a new currency, the new afghani, at an exchange rate of 43 afghani to the US dollar. This new afghani replaced its two previous versions at two different rates—the currency issued by the government of President Burhanuddin Rabbani was replaced at the rate of 1000 to the new afghani, whereas the currency issued by the government of Abdul Rashid Dostum was replaced at the rate of 2000 to the new afghani. The central bank issued instructions that the new currency should be used to make all domestic transactions, replacing all other currencies in use. All existing contracts were to be rewritten in terms of the new afghani at the specified exchange rates. Assuming that the government was successful in carrying out this exercise, what will be the impact of this change on output and employment?

a. Output and employment will fall, since fewer currencies are in circulation

b. Output and employment will rise, since production will benefit from a stable currency

c. Output and employment will remain unchanged, since the contracts are rewritten in terms of new currency

d. Cannot be determined from the given information

14. Suppose the central bank of Pakistan conducts open market operations which lead to an expansion of its monetary base. For this to actually result in an increase in money supply, one of the assumptions must be

a. full employment level of output

b. a stable demand function for money

c. a stable production function

d. a low rate of inflation

The next three questions are based on the following information :

Consider an economy where the aggregate output is produced by using two factors K and L, using a production function $Y = K^{\alpha}L^{1-\alpha}$. At every point of time, both factors are fully employed. A constant proportion s of total output is saved and automatically invested at each point in time, leading to augmentation of capital stock. However, capital is also subject to depreciation at a rate δ. Labour force grows at a constant rate n.

15. The steady-state level of per capita output is given by

a. $s\left(\frac{K}{L}\right)^{\alpha} - (n+\delta)\frac{K}{L}$

b. $\left(\frac{s}{n+\delta}\right)^{\frac{1}{1-\alpha}}$

c. $\left(\frac{s}{n+\delta}\right)^{\frac{\alpha}{1-\alpha}}$

d. cannot be determined from the given information

16. The optimal savings rate which will maximize the per capita consumption level at the steady state is given by

a. α

b. $n+\delta$

c. $\alpha(n+\delta)$

d. $\left(\frac{s}{n+\delta}\right)^{\frac{1}{1-\alpha}}$

17. With $\alpha = \frac{1}{3}$, the rate of population growth = 1 percent and depreciation rate of capital = 5 percent, how long will the economy take to get to halfway of its balanced growth path values within a Solow framework?

a. 15·5 years

b. 17·5 years

c. 21·5 years

d. 25·5 years

18. Suppose the following bilateral spot exchange rates are being quoted for the Afghan Afghani (AFN), Bangladeshi Taka (BDT) and Maldivian Rufiyaa (MVR) :

BDT/MVR = 5·26

AFN/MVR = 4·54

AFN/BDT = 0·88

If you start with 100 MVR, the most you could end up with (in MVR) in a single round of trilateral arbitrage would be

a. 93·33

b. 98·08

c. 101·96

d. 102·67

19. Consider the following system of equations :

$$\begin{aligned} x_1 + x_3 &= 3 \\ x_1 - x_2 - x_3 &= 1 \\ -x_1 + x_2 &= 4 \end{aligned}$$

The above system of linear equations is

a. inconsistent

b. consistent with infinitely many solutions

c. consistent with a unique solution

d. none of the above

20. The rank of the matrix

$$\begin{pmatrix} 5-x & 2 & 1 \\ 2 & 1-x & 0 \\ 1 & 0 & 1-x \end{pmatrix}$$

for $x = 6$ is

a. 1

b. 2

c. 3

d. 0

21. If the function $y = AK^a$ for $A > 0$ and $0 < a < 1$ is defined for all K, then y is

a. strictly convex

b. strictly concave

c. quasi-convex

d. quasi-concave

22. The real eigenvalues of $\begin{pmatrix} 1 & 2 \\ 3 & 0 \end{pmatrix}$ are

a. 2 and 3

b. -2 and -3

c. 2 and -3

d. -2 and 3

23. For what values of x are the two vectors $A = (x, -x-8, x, x)$ and $B = (x, 1, -2, 1)$ orthogonal?

a. -2 and 4

b. 2 and -4

c. -2 and -4

d. 2 and 4

24. The inflexion point for $f(x) = x^4$ at $x = 0$ is

a. 0

b. 1

c. -1

d. It does not have an inflexion point

25. If a random variable X has a continuous distribution with the probability function

$$f(x) = \begin{cases} \frac{1}{8}x & \text{for } 0 < x < 4 \\ 0 & \text{otherwise} \end{cases}$$

the value of t such that $\Pr(X \geq t) = \frac{1}{2}$ is

a. $\sqrt{8}$

b. $\sqrt{3}$

c. $2\sqrt{3}$

d. $4\sqrt{3}$

26. Which of the following assumptions shows the consistency, unbiasedness and efficiency of the OLS estimator?

(i) $E(u_t) = 0$

(ii) var $(u_t) = 0$

(iii) cov $(u_t, u_{t-j}) = 0 \; \forall \; j$

(iv) $u_t \sim N(0, \sigma^2)$

a. (ii) and (iv) only

b. (i) and (iii) only

c. (i), (ii) and (iii) only

d. (i), (ii), (iii) and (iv)

27. What would be the consequences for the OLS estimator if heteroscedasticity is present in a regression model but ignored?

a. It will be biased

b. It will be inconsistent

c. It will be inefficient

d. All of the above

28. What will be the properties of the OLS estimator in the presence of multicollinearity?

a. It will be consistent, unbiased and efficient

b. It will be consistent and unbiased but not efficient

c. It will be consistent but not unbiased

d. It will not be consistent

29. Under the null hypothesis of a Bera-Jarque test, the distribution has

a. zero skewness and zero kurtosis

b. zero skewness and kurtosis of three

c. skewness of one and zero kurtosis

d. skewness of one and kurtosis of three

30. Which one of the following would be a plausible response to a finding of residual non-normality?

a. To use a logarithmic functional form instead of a linear one

b. To add lags of the variables on the right-hand side of the regression model

c. To estimate the model in first differenced form

d. To remove any large outliers from the data

SECTION—B

Answer *any* **four** questions

Each question carries *10* marks

31. A universal basic income grant for all citizens is being proposed as an effective welfare measure for many developing countries. Do you agree with this view? Substantiate your argument.

32. Globalization has been unfair to the developed countries as it has led to significant deindustrialization in the Global North. Comment.

33. Suppose a production function is given by $y = f(K, L) = \{(L)^{1/2} + K\}$, and that the price of capital (w_2) is 2 and the price of labour (w_1) is 3, and the firm pays a license fee of 10.

(a) What are the quantities of labour and capital that will minimize the cost of producing any given output?

(b) What will be the minimum cost of producing y units of output?

(c) Find the marginal cost of production, the average total cost and the average variable cost and the average fixed cost.

34. A monopoly insurance company provides accident insurance to two types of customers—low-risk customers, for whom the probability of an accident is 0·25 and high-risk customers, for whom the probability of an accident is 0·5. There is an equal number of both types of customers. Without insurance, each customer's wealth is 16 if there is no accident, but 0 if there is an accident. Customers' von Neumann-Morgenstern utility of wealth is $u(w) = \sqrt{w}$. The insurance company cannot identify the type of customer when the customer applies for an insurance contract. Suppose the insurance company offers two contracts—the first contract offers a payout of 8 in case there is an accident, and requires customers to pay a premium of 7. The second contract offers a payout of 16 in case there is an accident, but requires customers to pay a premium of 10.

(a) Which of these contracts will be bought by the low-risk customers and which will be bought by high-risk customers?

(b) Will the insurance company manage to screen its customers with these contracts?

(c) Calculate the insurance company's expected profit if it offers these contracts.

35. Consider an economy with several physical goods and uncertainty over states of nature. Let the equilibrium be arrived at in two distinct stages—in the first stage (before the state of nature is revealed) all contingent markets are open for trade and contracts for all contingent commodities are traded in these markets; in the second stage the state of nature is revealed, contracts are executed and consumption takes place.

(a) Construct a simple model and examine the welfare implications of its outcome.

(b) Show how the presence of a market for financial securities might increase the possibilities of an efficient outcome. Explain the economic intuition of the above result.

36. Why do Keynesian theories not make strong predictions about the impact of fluctuations in aggregate demand on variables like unemployment, real wage and markup?

37. (a) Suppose we are given a simple panel data regression model

$$y_{it} = \mu_i + \lambda x_{it} + \varepsilon_{it}$$

where μ_i is the time constant unobserved effect and ε_{it} is the idiosyncratic error. Briefly explain the crucial assumption on μ_i that allows us to distinguish between fixed effect and random effect methods of estimation. Is this assumption testable? 5

(b) Distinguish between strict and sequential exogeneity. Show that strict exogeneity cannot be satisfied when we have lagged values of dependent variables as regressors. 5

38. Consider the following ADL (1, 1) model :

$$y_t = \alpha + \gamma y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + \varepsilon_t$$

(a) Explain under what conditions the following models can be obtained from the ADL (1, 1) model described above : 4

(i) Static regression

(ii) Autoregressive process of order 1 (i.e., AR(1))

(iii) Equation in first difference

(iv) First-order distributed lag model

(b) Write the model as an error correction model, and provide an economic interpretation of it. 3

(c) Suppose that the variables y_t and x_t are both $I(1)$. Discuss how the error correction model is related to the concept of cointegration. 3

SPACE FOR ROUGH WORK