

Exam. Code : 121205

Subject Code : 502263

B.A./B.Sc. 5th Semester (Batch 2023-26) (CBGS)

ECONOMICS

(Economics of Development)

Time Allowed—3 Hours]

[Maximum Marks—100

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. Define underdeveloped economies. Discuss the main features of underdeveloped economies. 5+15
2. Explain Lewis's model of unlimited supply of labor. What are its limitations? 15+5

SECTION—B

3. What are the characteristics of Harrod-Domar model of growth? 20
4. Critically examine Solow's model of long-run growth. 20

SECTION—C

5. Critically evaluate the balanced strategy of economic development. 20
6. Explain Libenstein's Critical Minimum Effort Thesis. 20

SECTION—D

7. What is the meaning of capital formation? What are the internal and external sources of capital formation? 20
8. Explain the various types of Planning. What is the role of planning in underdeveloped economies? 10+10

(Punjabi Version)

ਨੋਟ :— ਹਰੇਕ ਭਾਗ ਵਿੱਚੋਂ ਘੱਟੋ-ਘੱਟ ਇੱਕ ਪ੍ਰਸ਼ਨ ਦੀ ਚੋਣ ਕਰਦੇ ਹੋਏ, ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰੋ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ। ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਅੰਕ ਬਰਾਬਰ ਹਨ।

ਭਾਗ—ੳ

1. ਘੱਟ ਵਿਕਸਤ ਅਰਥਵਿਵਸਥਾਵਾਂ ਨੂੰ ਪਰਿਭਾਸ਼ਿਤ ਕਰੋ। ਘੱਟ ਵਿਕਸਤ ਅਰਥਵਿਵਸਥਾਵਾਂ ਦੀਆਂ ਮੁੱਖ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ 'ਤੇ ਚਰਚਾ ਕਰੋ। 5+15
2. ਲੇਵਿਸ ਦੇ ਕਿਰਤ ਦੀ ਅਸੀਮਿਤ ਸਪਲਾਈ ਦੇ ਮਾਡਲ ਦੀ ਵਿਆਖਿਆ ਕਰੋ। ਇਸ ਦੀਆਂ ਸੀਮਾਵਾਂ ਕੀ ਹਨ ? 15+5

ਭਾਗ—ਅ

3. ਵਿਕਾਸ ਦੇ ਹੈਰੋਡ-ਡੋਮਰ ਮਾਡਲ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ ਕੀ ਹਨ ? 20
4. ਸੋਲੋ ਦੇ ਲੰਬੇ ਸਮੇਂ ਦੇ ਵਿਕਾਸ ਦੇ ਮਾਡਲ ਦੀ ਆਲੋਚਨਾਤਮਕ ਤੌਰ 'ਤੇ ਜਾਂਚ ਕਰੋ। 20

ਭਾਗ—ਏ

5. ਆਰਥਿਕ ਵਿਕਾਸ ਦੀ ਸੰਤੁਲਿਤ ਰਣਨੀਤੀ ਦਾ ਆਲੋਚਨਾਤਮਕ ਮੁਲਾਂਕਣ ਕਰੋ। 20
6. ਲਿਬਨਸਟਾਈਨ ਦੇ ਕੈਰਿਟੀਕਲ ਮਿਨੀਮਮ ਯਤਨਾਂ ਦੇ ਥੀਸਿਸ ਦੀ ਵਿਆਖਿਆ ਕਰੋ। 20

ਭਾਗ—ਸ

7. ਪੂੰਜੀ ਨਿਰਮਾਣ ਦਾ ਕੀ ਅਰਥ ਹੈ ? ਪੂੰਜੀ ਨਿਰਮਾਣ ਦੇ ਅੰਦਰੂਨੀ ਅਤੇ ਬਾਹਰੀ ਸਰੋਤ ਕੀ ਹਨ ? 20
8. ਯੋਜਨਾਬੰਦੀ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਕਿਸਮਾਂ ਦੀ ਵਿਆਖਿਆ ਕਰੋ। ਘੱਟ ਵਿਕਸਤ ਅਰਥਵਿਵਸਥਾਵਾਂ ਵਿੱਚ ਯੋਜਨਾਬੰਦੀ ਦੀ ਕੀ ਭੂਮਿਕਾ ਹੈ ? 10+10

(Hindi Version)

ਨੋਟ :— ਪ੍ਰत्यੇਕ भाग में से कम से कम एक प्रश्न का चयन करते हुए, कुल पाँच प्रश्न करें। पांचवा प्रश्न किसी भी भाग में से किया जा सकता है। सभी प्रश्नों के समान अंक हैं।

भाग—क

1. अल्पविकसित अर्थव्यवस्थाओं को परिभाषित कीजिए। अल्पविकसित अर्थव्यवस्थाओं की मुख्य विशेषताओं पर चर्चा कीजिए।

5+15

2. लुईस के श्रम की असीमित आपूर्ति के मॉडल की व्याख्या कीजिए। इसकी सीमाएँ क्या हैं? 15+5

भाग—ख

3. विकास के हैरोड-डोमर मॉडल की विशेषताएँ क्या हैं? 20
4. सोलो के दीर्घकालिक विकास के मॉडल का आलोचनात्मक परीक्षण कीजिए। 20

भाग—ग

5. आर्थिक विकास की संतुलित रणनीति का आलोचनात्मक मूल्यांकन कीजिए। 20
6. लिबेन्स्टीन के आवश्यक न्यूनतम प्रयत्न थीसिस की व्याख्या कीजिए। 20

भाग—घ

7. पूँजी निर्माण का क्या अर्थ है? पूँजी निर्माण के आंतरिक और बाह्य स्रोत क्या हैं? 20
8. नियोजन के विभिन्न प्रकारों की व्याख्या कीजिए। अल्पविकसित अर्थव्यवस्थाओं में नियोजन की क्या भूमिका है?

10+10

Exam. Code : 121205

Subject Code : 502320

B.A./B.Sc. 5th Semester (Batch 2023-26) (CBGS)

MATHEMATICS

Paper-II (Number Theory)

Time Allowed—3 Hours]

[Maximum Marks—75

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. (a) Show that $2^{2n} - 1$ is divisible by 15 if n is an even positive integer.
- (b) Show that the square of an integer is of the form $3q$ or $3q + 1$ but not of the form $3q + 2$, $q \in \mathbb{Z}$.
2. (a) Find gcd of 858 and 325 and express it in the form $858x + 325y$.
- (b) Find the general solution (in integers) of the equation $525x + 231y = 42$.

SECTION—B

3. (a) For any positive real numbers x and y , prove that $[x-y] \leq [x] - [y] \leq [x-y] + 1$, where $[x]$ is the greatest integer function.
- (b) How many integers between 100 and 1000 are divisible by 7?
4. (a) If p and $2p + 1$ both are odd primes and $m = 4p$, then prove that $\phi(m+2) = \phi(m) + 2$, where ϕ is Euler's phi function.
- (b) Find a positive integer n such that:
 $\mu(n) + \mu(n+1) + \mu(n+2) = 3$, where μ is the Mobius function.

SECTION—C

5. (a) If m is an integer, show that:
 $m^2 + m + 1 \equiv 1 \pmod{3}$.
- (b) If $ab \equiv cd \pmod{m}$ and $b \equiv d \pmod{m}$ where $\gcd(b, m) = 1$, then prove that $a \equiv c \pmod{m}$.
6. (a) Solve: $17x \equiv 9 \pmod{276}$.
- (b) Solve: $x \equiv 2 \pmod{3}$, $x \equiv 3 \pmod{5}$, $x \equiv 5 \pmod{2}$.

SECTION—D

7. (a) Using Fermat's little theorem, show that:

$$a^{21} \equiv a \pmod{15}.$$

- (b) By Euler's theorem, show that the last two digits in the decimal representation of 3^{256} are 2 and 1.

8. (a) Prove that an integer $p > 1$ is a prime number iff

$$p-2 \equiv 1 \pmod{p}.$$

- (b) Encrypt the message "RETURN HOME" using Caesar Cipher.

Exam. Code : 121205
Subject Code : 502250

B.A./B.Sc. 5th Semester (Batch 2023-26) (CBGS)
PUNJABI (Compulsory)

Time Allowed—3 Hours]

[Maximum Marks—100

ਨੋਟ :— ਹਰੇਕ ਭਾਗ ਵਿੱਚੋਂ ਘੱਟੋ-ਘੱਟ ਇੱਕ ਪ੍ਰਸ਼ਨ ਦੀ ਚੋਣ ਕਰਦੇ ਹੋਏ, ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰੋ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ। ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਅੰਕ ਬਰਾਬਰ ਹਨ।

ਭਾਗ—ੳ

1. ‘ਸੌਰੀ’ ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ ਲਿਖੋ।
2. ‘ਖੂਹ ਖਾਤੇ’ ਕਹਾਣੀ ਦਾ ਸਾਰ ਆਪਣੇ ਸ਼ਬਦਾਂ ਵਿੱਚ ਲਿਖੋ।

ਭਾਗ—ਅ

3. ‘ਪਵਿੱਤਰ ਪਾਪੀ’ ਨਾਵਲ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ ਲਿਖੋ।
4. ‘ਨਾਨਕ ਸਿੰਘ’ ਦੇ ਪੰਜਾਬੀ ਸਾਹਿਤ ਵਿੱਚ ਪਾਏ ਯੋਗਦਾਨ ਉੱਪਰ ਚਰਚਾ ਕਰੋ।

ਭਾਗ—ੲ

5. ਕਿਸੇ ਇੱਕ ਵਿਸ਼ੇ ਉੱਪਰ ਪੈਰਾ ਰਚਨਾ ਕਰੋ :
(ੳ) ਸਲੀਕਾ
(ਅ) ਰੁੱਖਾਂ ਦਾ ਮਹੱਤਵ।

6. ਹੇਠ ਲਿਖੇ ਪੈਰ੍ਹੇ ਦਾ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਕਰੋ :

When Maharaja Ranjit Singh was on his winning military expeditions Shah Zaman, the grandson of Abdali, invaded Lahore. This was his second invasion; during his first invasion also he had gone on a wide spread looting spree and had perpetrated cruelties over the people. That is why, at the time of his second attack, the people fled their homes from out of terror. They had a lurking fear that they would not be able to pay the penalty imposed by Shah Zaman and consequently they would have to become a prey to his cruelties.

ਭਾਗ—ਸ

7. ਵਿਅੰਜਨ ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਨ ਕਰੋ।
8. ਕਾਰਕ ਦੀ ਪਰਿਭਾਸ਼ਾ ਦਿੰਦਿਆਂ ਕਿਸਮਾਂ ਦੱਸੋ।

Exam. Code : 121205
Subject Code : 502283

B.A./B.Sc. 5th Semester (Batch 2023-26) (CBGS)

QUANTITATIVE TECHNIQUES

(Quantitative Techniques—V)

Time Allowed—3 Hours]

[Maximum Marks—100

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The **fifth** question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. Explain, in detail, maximum likelihood method of estimation.
What are its applications ? 20
2. (a) What are Type I and Type II errors ?
(b) Distinguish between one-tailed and two-tailed tests.
(c) What are the properties of a good estimator ?
(d) What do you mean by critical region ? $5 \times 4 = 20$

SECTION—B

3. Derive the properties of Z distribution. 20
4. Derive the properties of t-distribution. 20

SECTION—C

5. (a) What are the assumptions of F test ?
- (b) Two samples are drawn from two normal populations. From the following data, test whether the two samples have the same variance at 5 percent level :

Sample 1 : 60 65 71 74 76 82 85 87

Sample 2 : 61 66 67 85 78 63 85 86 88 91

$$5+15=20$$

6. (a) What are the applications of t-test ?
- (b) The sales data of an item in six shops before and after a special promotional campaign are as under :

Shops :	A	B	C	D	E	F
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Before Campaign :	53	28	31	48	50	42
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After Campaign :	58	29	30	55	56	45
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Can the campaign be judged to be a success ? Test at 5 percent level of significance.

$$5+15=20$$

SECTION—D

7. Outline various steps in carrying out the analysis of variance of a two-way classified data with one observation per cell. Give the mathematical model and the underlying assumptions.

20

8. A trucking company wishes to test the average life of each of the four brands of tyres. The company uses all brands on randomly selected trucks. The records showing the lives (thousands of miles) of tyres are given in the following table :

Brand 1	Brand 2	Brand 3	Brand 4
20	19	21	15
23	15	19	17
18	17	20	16
17	20	17	18
—	16	16	—

Test the hypothesis that the average life for each brand of tyres is the same. Assume $\alpha = 0.01$. 20

Exam. Code : 121205

Subject Code : 502275

B.A./B.Sc. 5th Sem. (Batch 2023-26) (CBGS)

MATHEMATICS (Dynamics)

Paper : I

Time Allowed—3 Hours]

[Maximum Marks—100

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. (a) Two cars start off the race and travel in a straight line with velocities u, v and the corresponding uniform acceleration α, β . Prove that the length of the course is
$$\frac{2(u-v)(u\beta - v\alpha)}{(\alpha - \beta)^2}$$

(b) A girl standing on a bridge 28 m above a river throws a stone vertically downwards with a speed of 23.1 m/sec. How long will it take to strike the surface of the water?
2. (a) A man of 150 kg descends from a window with the help of a rope whose breaking strength is 120 kg. If the distance to be covered is 20 m, find the maximum time he can use the rope.

- (b) Prove that the least possible acceleration is $\frac{\sqrt{3}}{2}g$, if the string of an Atwood's machine can bear a strain of only $\frac{1}{8}$ of the sum of two weights.

SECTION—B

3. (a) A 4 kg body is placed at the bottom of a plane, inclined at 30° to the horizontal and of length 4 m. It is connected by a light string passing over a smooth pulley at the top of the plane to a mass of 3 kg which hangs vertically. What is the common acceleration of the masses and the time that elapses before the first particle arrives at the top of the plane?
- (b) A body moving with a velocity of 20 m/sec on a level road comes to the bottom of a smooth inclined plane of inclination 30° . It ascends the plane and just comes to rest at the top. What is the length of the plane?
4. (a) A particle starts with velocity u and moves with a retardation equal to k times the space described. Show that the distance moved before it comes to rest is $\frac{u}{\sqrt{k}}$.

- (b) A point executes a simple harmonic motion such that in two of its positions the velocities are u, v and the corresponding distances from the centre are x_1 and x_2 . Prove that the period of motion is

$$2\pi \sqrt{\frac{x_2^2 - x_1^2}{u^2 - v^2}}.$$

SECTION—C

5. (a) A girl can throw a cricket ball 100 m. How long is the ball in the air? Also find the height attained by the ball.
- (b) If α is the angle between the tangents at the extremities of any arc of a parabolic path and v, v_1 the velocities at these extremities and u their horizontal component, find the time of describing the arc.
6. (a) A Pendulum of length L makes m complete oscillations in 24 hours. When its length is slightly altered, it makes $m+n$ oscillations in 24 hours. Show that the dimension in length is $\frac{2nL}{m}$ nearly.
- (b) Two masses M and m are connected by a light string of length L which passes through a small fixed ring. Find how many revolutions per second must m make as a conical pendulum in order that M may hang at rest at a distance a below the ring.

(Contd.)

SECTION—D

7. State and prove the Principle of Conservation of Energy.

8. (a) A car of weight 100 kg accelerates at 2 m/sec^2 up

the inclined plane with inclination $\sin^{-1} \frac{3}{50}$. Calculate

the power exerted by the engine when the speed is 20 m/sec , the resistance being $20 \text{ gm-weight per kg-wt}$.

(b) A body of 600 kg is pushed over a level surface. Its velocity remains constant when it is pushed with a horizontal force of 200 newtons . Assuming frictional force to be constant, determine the work done in pushing the body through a distance of 3 meters if:

(i) velocity remains constant.

(ii) velocity increases from 0 m/sec to 4 m/sec .

Exam. Code : 121205
Subject Code : 502255

B.A./B.Sc. 5th Semester (Batch 2023-26) (CBGS)
COMPUTER SCIENCE
(Database Management System & Oracle)

Time Allowed—3 Hours]

[Maximum Marks—75

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. Compare DBMS and early file system bringing out the major advantages of the database approach.
2. Discuss the three level architecture of database management system. Explain the various types of data independence. How mapping is performed between different levels of database architecture? Explain.

SECTION—B

3. Define DBTG. Explain BCNF, 1NF, 2NF and 4NF normal forms.
4. What is Data Model? What are the various data models available for database systems?

SECTION—C

5. List and explain DDL and DML statements with suitable example.
6.
 - (a) Discuss various types of aggregate functions in detail.
 - (b) Compare and contrast Equi Joins with Outer Joins.

SECTION—D

7. What do you mean by database security? How database security is enforced in a database system? Discuss in detail.
8. Write short notes on:
 - (a) Big Data Analytics
 - (b) NoSQL.

Exam. Code : 121205
Subject Code : 502249

B.A./B.Sc. 5th Semester (Batch 2023-26) (CBGS)

ENGLISH (Compulsory)

Paper : ENC-301

Time Allowed—3 Hours]

[Maximum Marks—100

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. Discuss Joe Keller as hero in *All My Sons*. 20
2. What are the main themes in *All My Sons*? 20

SECTION—B

3. Critically analyze William Wordsworth's Poem *The World is Too Much With Us*. 20
4. Critically analyze Robert Browning's *Meeting at Night*. 20

SECTION—C

5. Discuss Mathew Arnold's Poem *Dover Beach*. 20
6. Critically analyze Nissim Ezekiel's Poem *Night of the Scorpion*. 20

SECTION—D

7. Write a letter to the Editor of a Newspaper highlighting the problems of Street Begging. 20
8. Write a resume for the post of Computer Science teacher in a college. 20