



**GANDHI INSTITUTE FOR TECHNOLOGY (GIFT)**  
(An Autonomous Institution)

Registration No:

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Total Number of Pages: 02

BTech

BTCS-T-ES-301

3<sup>rd</sup>Semester End Semester Examination: 2023-24

Subject Name: OOPs using Java

BRANCH(S): BTech

Max Marks: 100

Time: 3 Hour

Q. Code: BT317

*Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III  
The figures in the right hand margin indicate marks.*

Part - I		CO	BTL
01	Answer the following questions: (10 x 2)		
a)	What do you know by java byte code?	1	2
b)	Why is the main method static in Java?	1	2
c)	What happens when a class doesn't contain any constructor? How its data members are initialized?	2	2
d)	Write difference between final and finally keyword in java?	2	2
e)	Differentiate between compile-time and runtime polymorphism.	3	2
f)	Explain equals() and compareTo() methods of String class.	3	2
g)	Find output. String s1="125",s2="251"; int n1=Integer.parseInt(s1),n2= Integer.parseInt(s2); System.out.println(s1+s2); System.out.println(n1+n2+Integer.parseInt(s1+s2));	4	2
h)	Define the term package. Name any 5 java library packages.	4	2
i)	Differentiate between sleep() and wait() method in multithreading in java.	5	2
j)	Explain the role of the "TextField" class in AWT.	6	2
Part-II		CO	BTL
Answer any eight questions (06 x 08)			
02	a) Explain instance variables, local variables and argument variables with suitable example.	2	3
b)	Write a java program to print the greatest and smallest of N integers.	1	3
c)	Write a java program that defines a class 'Rectangle' with instance variables for length and width. The class also contains a parameterized constructor and methods to display the instance variables and also a method to compare length and width of a rectangle.	2	4
d)	Write a Java program to calculate the ratio of male to female voters among N voters of class "Voter" with instance variables 'name' and 'gender'.	2	4



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e)	Write an example program to show constructor overloading in a class 'Employee' with instance variables name and age.	3	3
f)	Write a Java program that takes a string as input and counts the total number of alphabets, digits and special symbols present in it.	3	4
g)	Explain the concept of Wrapper classes, boxing and unboxing in java.	4	3
h)	Provide an example of creating and using a custom package.	4	3
i)	Define the term "thread priority" in Java. How can you assign and get the priority of a thread.	5	3
j)	What do you know by thread synchronization? How can you achieve it?	5	3
k)	How do you use try-catch blocks for handling exceptions in Java?	6	3
l)	Write a java program to design a Login frame using awt components.	6	3

**Part-III**

Answer any Two questions from the Q-3 to Q-6 (16 x 2)

03	a)	Write a Java program to print the common elements present in two different arrays of integers.	1	3
	b)	Imagine you have an abstract class called "Bank" that offers functionality to determine the rate of interest through the method interest Rate(). Generate subclasses named SBI, ICICI, and AXIS banks. These subclasses should specify interest rates of 8%, 7.5%, and 9%, respectively. Write a java program for it.	2	4
04	a)	Write a program to overload a method sum() as follows: i) int sum(int n)- To calculate and return sum of all multiples of 3 up to n. ii) int sum(int m , int n)- To calculate and return sum of all numbers between m and n which are divisible by 3 or 5.	3	3
	b)	Write a Java program to provide an example of using an interface to achieve multiple inheritances.	3	4
05	a)	Design a frame in java to accept students Name, Roll No, Branch , Year, CGPA and Grade by using Label, text Field and a suitable layout manager.	6	3
	b)	Define inheritance. Explain different types of inheritance by taking real world examples.	4	3
06	a)	Describe the various states a thread can be in during its lifecycle in Java.	5	3
	b)	Write a program to accept a number and print whether or not it is a lead number. A number is said to be a lead number if its sum of even digits is same as sum of odd digits. Eg. 72344 $7+3=2+4+4$	1	3



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Total Number of Pages: 04

BTech

BTCS-T-ES-301

2023-24

**3<sup>rd</sup> Semester Improvement End Semester Examination: 2023-24**  
**OOPs using Java**

**BRANCH(S): BTech(Ag,Civil,CSE,ECE,EEE & Mech)**

**Max Marks: 100**

Time : 3 Hour

Q. Code: 23BT3101

*Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III  
The figures in the right hand margin indicate marks.*

Part - I		(10 x 2)	CO	BTL
01	Answer the following questions:			
a)	Write any four keywords in java.	1	2	
b)	List the primitive data types in Java.	1	2	
c)	What is the advantage of inheritance in Java?	2	2	
d)	What is a static variable, and how it is different from an instance variable?	2	2	
e)	How substrings are extracted using the String class in Java?	3	2	
f)	What is a constructor?	3	2	
g)	Explain the role of the "valueOf" method in wrapper classes.	4	2	
h)	How do wrapper classes convert primitive types to objects?	4	2	
i)	What is the purpose of the "yield()" method in Java threads?	5	2	
j)	Explain the significance of the "finally" block in exception handling.	6	2	
Part-II		(06 x 08)	CO	BTL
Answer any eight questions				
02	a)	Explain the roles of JDK, JRE, and JVM.	1	3
	b)	Write a Java program that checks whether a given year is leap year.	1	3
	c)	Write a java program to check whether a number is prime number.	2	4
	d)	Write a Java program to calculate the ratio of male to female voters among N voters of class "Voter" with instance variables 'name' and 'gender'.	2	4
	e)	What is method overriding? Write a Java program to demonstrate method overriding.	3	3
	f)	Write a program to calculate the area and perimeter of a circle object. Define a class circle with instance variable radius for this purpose.	3	3
	g)	List the Wrapper classes in Java and mention their common uses.	4	3
	h)	Explain the process of creating user-defined packages in Java.	4	3
	i)	Implement a multithreaded program using the Runnable interface.	5	3
	j)	Define the term "thread priority" in Java. Explain its significance.	3	3
	k)	How do you create custom exceptions in Java? Provide an example.	6	3



Registration No:

A horizontal row of ten empty rectangular boxes, intended for children to write their names in. The boxes are arranged in a slightly downward-sloping line from left to right.

	I)	How do you handle window closing events in AWT? Provide an example using WindowListener.	6	3
		Part-III Answer any Two questions from the Q-3 to Q-6 (8 x 2)	CO	BTL
03	a)	Write a Java program that separates an array of integers into two arrays - one for even numbers and another for odd numbers.	1	3
	b)	Define a student class with instance variables name and roll. Include a method to display the details of any student.	2	4
04	a)	Write a Java program that takes a sentence as input and counts the number of words.	3	4
	b)	Write an example program to demonstrate method overriding. Use appropriate comment lines to explain it.	3	3
05	a)	Compare and contrast primitive data types with their corresponding Wrapper classes.	4	3
	b)	Explain the benefits of using packages in Java development.	4	3
06	a)	Create a Java program to build a simple GUI application that includes a frame with a button. When the button is clicked, display a message.	6	4
	b)	Describe the order of exception handling when multiple exceptions are thrown in a try block.	6	3

\*\* BTL: Bloom's Taxonomy Level

### **\*\* CO: Course Outcomes**

**BTL are:**

1. Remembering, 2. Understanding, 3. Applying, 4. Analysing, 5. Evaluating and 6. Creating.



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Total Number of Pages: 04

BTech

BTME-T-PC-301

3<sup>rd</sup>Semester End Semester Examination: 2023-24

Subject Name: Engineering Mechanics of Solids

BRANCH(Mechanical): BTech

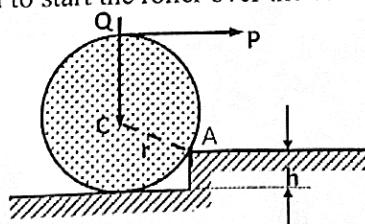
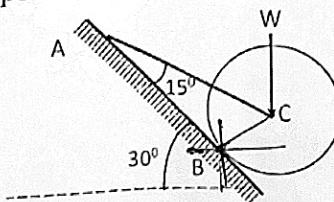
Time: 3 Hour

Max Marks: 100

Q. Code:BT308

Answer Question No. I (Part-I) which is compulsory, any eight from Part-II and any two from Part-III

The figures in the right hand margin indicate marks.

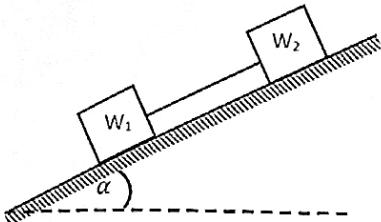
Part - I				
01	Answer the following questions:	(16 x 2)	CO	BTL
	a) What is meant by specification of a force?			
	b) Define angle of repose.			
	c) The resultant of two equal forces P including an angle $\alpha$ is R. Find $\alpha$ .			
	d) Differentiate between centroid and centre of gravity.			
	e) What is meant by perpendicular axis theorem?			
	f) What do you mean by temperature stress?			
	g) Define principle of St. Venant.			
	h) What is Point of Contraflexure?			
	i) A free end of a cantilever beam rotates by 0.001 radians under a point load 10 kN. Then deflection at the free end due to a moment of 100 KN - m is _____.			
	j) Briefly explain the different types of beams.		CO	BTL
Part-II				
	Answer any eight questions	(06 x 08)		
02	a) A roller of radius $r = 12$ cm and weight $Q = 2000$ N is to be pulled over a curb of height $h = 6$ cm by a horizontal force $P$ applied to the end of a string wound around the circumference of the roller as shown in the Figure. Find the magnitude of $P$ required to start the roller over the curb.			
				
	b) A roller of weight $W = 1000$ N rests on a smooth inclined plane and is kept from rolling down by a string AC as shown in Figure. Find the tension $S$ in the string and reaction at the point of contact B.			
				



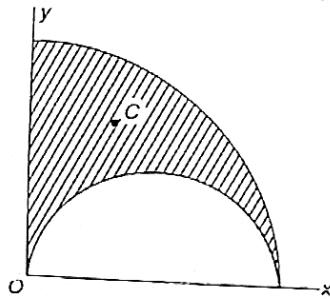
Registration No:

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- c) Two blocks of weights  $W_1$  and  $W_2$  rest on a rough inclined plane and are connected by a short piece of string as shown in the figure. If the coefficient of friction are  $\mu_1 = 0.2$  and  $\mu_2 = 0.3$  respectively, find the angle of inclination of the plane for which sliding will impend. Assume  $W_1 = W_2 = 600\text{N}$ .

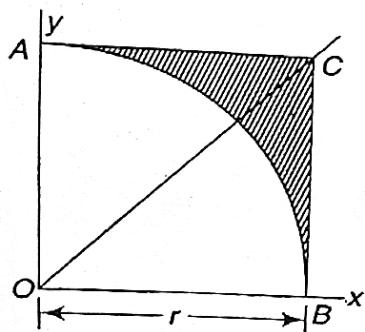


- d) Locate the centroid  $C$  of the shaded area obtained by cutting a semicircle of diameter ' $a$ ' from the quadrant of a circle of radius ' $a$ ' as shown in figure.



- e) State and derive the principle of Varignon.

- f) Find the polar moment of inertia of the shaded area as shown in figure with respect to point O.



- g) Draw and explain stress-strain diagram for mild steel material.

- h) A cantilever AB of length ' $l$ ' is subjected to a downward load  $P$  at its free end and an upward load  $P$  at distance ' $a$ ' from the free end. Draw S.F. and B.M. diagrams for the cantilever.

- i) Derive the expression for deflection of a cantilever of length ' $l$ ' carrying a concentrated load ' $P$ ' at a distance ' $a$ ' from the fixed end.

- j) A steel bar is placed between two copper bars each having same area and length as the steel bar at  $25^\circ\text{C}$ . At this stage they are rigidly connected together at both the ends. When the temperature is raised to  $325^\circ\text{C}$ , the length of the bars increases by 2.50 mm. Determine the original length and the final stresses in the bars. Take  $E_s = 2.1 \times 10^5 \text{ N/mm}^2$ ;  $E_c = 1.2 \times 10^5 \text{ N/mm}^2$



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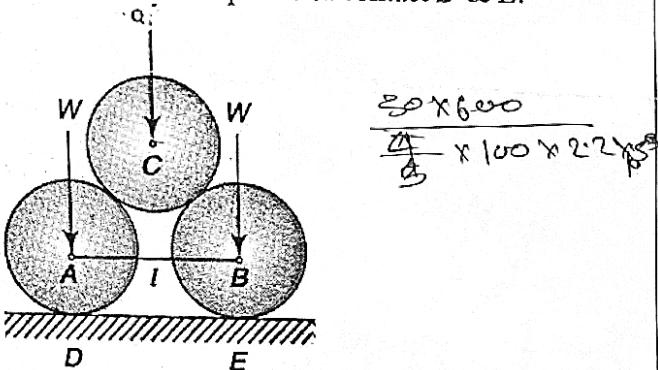
		$\alpha_s = 0.000012 \text{ per } {}^\circ\text{C}$ ; $\alpha_c = 0.0000175 \text{ per } {}^\circ\text{C}$ .		
k)	<p>Derive the relation between the Young's Modulus and the Modulus of rigidity.</p> <p>A brass bar having cross-sectional area of <math>1000 \text{ mm}^2</math> is subjected to axial forces as shown in figure. Find the total change in length of the bar. Take <math>E = 2.2 \times 10^5 \text{ N/mm}^2</math>.</p>			

### Part-III

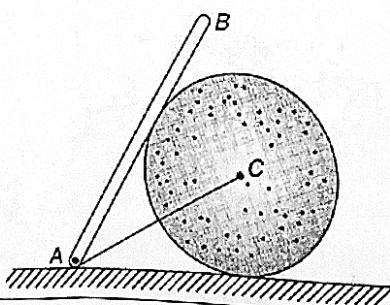
Answer any Two questions from the Q-3 to Q-6 (16 x 2)

CO **BTL**

- 03 a) Two smooth circular cylinders, each of weight  $W = 445 \text{ N}$  and radius  $r = 152 \text{ mm}$ , are connected at their centers by a string  $AB$  of length  $l = 406 \text{ mm}$  and rest upon a horizontal plane, supporting above them a third cylinder of weight  $Q = 890 \text{ N}$  and radius  $r = 152 \text{ mm}$  as shown in figure. Find the forces  $S$  in the string and the pressures produced on the floor at the points of contact  $D$  &  $E$ .



- b) A smooth right circular cylinder of radius  $r$  rests on a horizontal plane and is kept from rolling by an inclined string  $AC$  of length  $2r$  as shown in figure. A prismatic bar  $AB$  of length  $3r$  and weight  $Q$  is hinged at point  $A$  and leans against the roller as shown. Find the tension  $S$  that will be induced in the string  $AC$ .



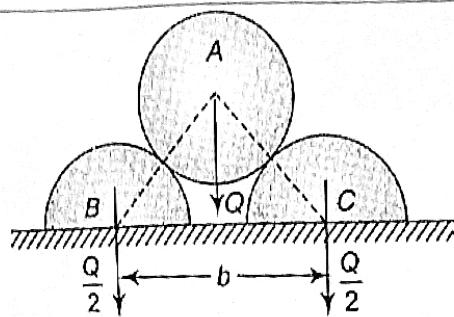
- 04 a) A smooth circular cylinder of weight  $Q$  and radius  $r$  is supported by two semicircular cylinders each of the same radius  $r$  and weight  $Q/2$  as shown in figure. If the coefficient of static friction between the flat faces of the semicircular cylinders and the horizontal plane on which they rest is 0.5 and friction between the cylinders themselves is neglected, determine the maximum distance  $b$  between the centers  $B$  and  $C$  for which equilibrium will be possible without the middle cylinder touching the horizontal plane.



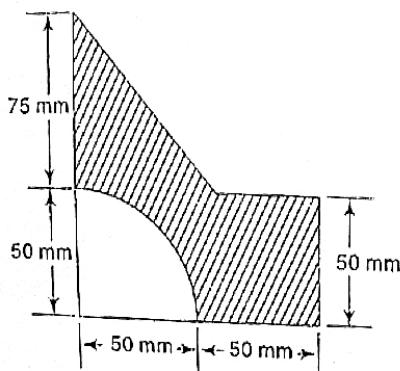
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- b) With respect to coordinate axes  $x$  and  $y$ , locate the centroid of the shaded area shown in figure.



- 05 a) A rectangular block 250mm x 100 mm x 80 mm is subjected to axial loads as follows: 480 kN tensile in the direction of its length. 900 kN tensile on the 250 mm x 80 mm faces. 1000 kN compressive on the 250 mm x 100 mm faces.

Assuming Poisson's ratio as 0.3, find in terms of the modules of elasticity  $E$  of the material the strains in the direction of each force.

If  $E = 2 \times 10^5$  N/mm $^2$ , find the values of the modulus of rigidity and bulk modulus for the material of the block due to the applications of the loading specified above.

- b) A cast iron beam 60 mm wide and 120 mm deep is simply supported on a span of 1.8 m. The beam carries a point load of 20 kN at the centre. Find the deflection at the centre. Take  $E = 108000$  N/mm $^2$ .

- 06 a) Draw the S.F. and B.M. Diagram for a simply supported beam with equal overhangs 'a' and carrying a UDL of 'w' per unit run over the whole length.

- b) A cantilever of length 2 metres carries a uniformly distributed load of 2500 N/m for a length of 1.25 m from the fixed end and a point load of 1000 N at the free end. If the section is rectangular 120 mm side and 240 mm deep, find the deflection at the free end. Take  $E = 108000$  N/mm $^2$ .

\*\* BTL: Bloom's Taxonomy Level

\*\* CO: Course Outcomes



Registration No:

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**BTech**  
**BTME-T-PE-301**

Total Number of Pages: 02

**3<sup>rd</sup> Semester End Semester Examination: 2023-24**  
**Subject Name: Introduction to Physical Metallurgy & Engineering Materials**  
**BRANCH (Mechanical): BTech**

**Max Marks: 100**

Time: 3 Hour

Q. Code: BT313

*Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III  
The figures in the right hand margin indicate marks.*

Part - I			
01	Answer the following questions:	(16 x 2)	CO      BTL
a)	Explain the term recrystallization.	2	1
b)	List out two differences between crystal structure and crystal system.	2	3
c)	Explain tempering.	5	1
d)	Define Burger Vector & state its Importance.	3	2
e)	Calculate the atomic packing factor for copper.	1	2
f)	Give two examples of ceramics	4	2
g)	Write off the composition of Bronze and Brass.	6	2
h)	Write down two differences between TTT and Iron-Carbon Phase Diagram.	4	3
i)	Why is heat treatment required?	5	2
j)	Write Gibb's phase rule and lever rule mentioning their formulae.	3	2

Part-II			
	Answer any eight questions	(06 x 08)	CO      BTL
02	a) Differentiate between H.C.P and F.C.C structure.	1	5
b)	Classify Engineering materials, cite one example from each.	1	1
c)	What is meant by Peritectic reaction?	4	3
d)	Draw the following planes in a F.C.C structure:(200), (220) and (112).	2	5
e)	Differentiate between Annealing & Normalising.	5	3
f)	List out the differences between thermosetting & thermoplastic polymers.	6	2
g)	Draw Stress - Strain diagram for Cast Iron, steel, & aluminium.	6	4
h)	Write down the difference between Edge and screw dislocation.	3	4
i)	NaCl crystals have FCC structure. The density of NaCl is 2.18gm/cc. Calculate the distance between two adjacent atoms .Atomic weight of Na is 23 & that of Cl is 35.5.	1	5
j)	Explain the reason for the increase in ductility of most metals as the temperature is raised.	2	4
k)	Define harden ability. Enumerate the five factors affecting the harden ability of the steel?	5	4
l)	Define "Mechanical property" of an engineering material. State any six mechanical properties	1	1
		CO	BTL



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Part-III				
Answer any Two questions from the Q-3 to Q-6			(16 x 2)	
03	a)	Sketch an iron-carbon diagram for a eutectoid (0.8% C) plain carbon steel and the corresponding T.T.T curve. Indicate the significance of the diagrams in the heat-treatment of steel.	5	4
04	b)	Describe in detail the application of phase rule in the study of phase diagram.	5	4
04	a)	With neat sketch Show all 7 Crystal structure & 14 Bravais lattices.	1	3
	b)	Draw Burgers vector to describe & illustrate the edge & Screw dislocations.	3	3
05	a)	Mention two types of solid solution & explain the factors governing solid solubility	3	2
	b)	Write composition & uses of Bronze, bell metal, Babbitt metal & Carbon steel	6	2
06	a)	State the comparison between ceramic and non-ceramic phases	6	2
	b)	Explain Fibre Reinforced type composites and their types.	6	1

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Total Number of Pages: 02

BTech  
BTSC-T-SC-301

3<sup>rd</sup> Semester End Semester Examination: 2023-24

Subject: EET

BRANCH(S) : All

Time: 3 Hour

Max Marks: 100

Q. Code : BT323

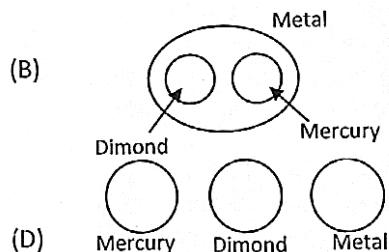
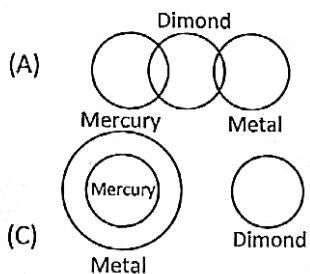
Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III  
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Part -I

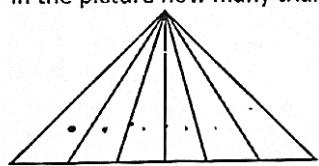
(2 x 10)

Q1. Answer the following questions:

- a) This of the following Venn diagram best represents the relation.



- b) Find the day of the date 4th January 1246?  
c) Find the unit digit of  $3^{442}$ .  
d) Price of an article first increase by 10% then reduces by 10%. What is the net percentage change in the price of the article?  
e) Population of a city increase by 10% every year. What is the percentage change in the population after 3 years?  
f) Find the compound interest on Rs. 4000 in 3 years, rate of interest being 10% per annum.  
g) In a chess board how many square are there?  
h) 100! Ends with how many zeros?  
i) In the picture how many triangles are there?



$$CP = P \left( 1 + \frac{R}{100} \right)^T$$

n +

- j) What is the unit digit of  $1! + 2! + 3! + \dots + 1777!$  ?

Part -II

(6 x 8)

2. Answer any eight out of twelve.

- a) Find the last two digits of  $25!$ ?  
b) A man invests Rs. 80,000 in two different banks are bank is offering 10% SI and other are offering 10% CI. The end of two year total investment received from both the banks is Rs.16400. Find the ratio of investment in both the banks.  
c) Find the difference between SI and CI in 4 years on Rs.15000, rate of interest being 8% per annum.



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- d) Population of city increase by 10% in the 1st year 20% in the second year and 30% in the 3rd year, Present population is 80000. What was the approximate population 3 years back?
- e) There is a cube of size 8cm x 8 cm x 8cm. All the 6 faces are painted Red colour and core is white. Then it is cut into 512 small cubes of size 1 x 1 x 1. How many small cubes are there having 1 side red painted?
- f) What is the unit digit of  $3^{544} \times 5^{544} \times 6^{544} \times 7^{544}$ ?
- g) HCF of two numbers is 13 and LCM is 1690. If one of the numbers is 130 then what is the other number?
- h) TEN  
TEN  
TEN  
TEN  
ONE  
(TEN + TEN + TEN + TEN = ONE)  
If each letter stands for a different digit, then TEN stands for what.
- i) A car covered a distance of 200 km. During the journey 5 wheels are used. If every wheel covered equal distance then find the distance covered by each wheel?
- j) Which of the following are Prime number and why? And also which are not prime number and why ? 493, 621, 667, 247, 131, 233.
- k) What is the unit digit of  $(2343)^{523} \times (724)^{245} \times (933)^{244}$ .
- l) One day a man added all the page numbers of a booklet. He got the answer as 2000. But he realized that by mistake he has skipped one page number. Find the missing page number.

(16x 2)

Part -III

**Answer any two out of four.**

3. In statements followed by 4 conclusions. Identify which conclusion can be derived from the given statements  
(draw the appropriate Venn diagram)

- A) St-1 : All doctors are clever.  
St-2 : All cleavers are rich.

**Conclusion:**

- 1) Some clever are rich.      2) Some doctors are rich.      3) Some doctors are not rich.  
4) Some rich are doctors.  
B) St-1 : Some poor are intelligent.      St-2 : Some intelligent are rich.

**Conclusion:**

- 1) Some poor are rich.      2) Some rich are intelligent      3) Some poor may be rich  
4) Some intelligent are poor

4. (A) Find the digit in the tens place and unit place last two digits of  $(41)^{293}$ .  
(B) If 4<sup>th</sup> January 1976 was on a Thursday, then what is the day of the date 15<sup>th</sup> Aug 1947?

5. (A): HCF of two numbers is 17 and LCM is 2210. How many such pairs exist?  
(B): What is the remainder when  $27!$  is divided by  $10^7$ .

6. (A): A mixture contains milk and water in the ratio 80% and 20% another mixture contain milk and water in the ratio 30% and 70 %. In what ratio they must be added so that the ratio between milk and water is the resulting number is 1: 1?  
(B): In a certain code  
0 is written as  $\beta$   
1 is written as  $\psi$   
2 is written as  $\psi\beta$   
3 is written as  $\psi\psi$   
4 is written as  $\psi\beta\beta$   
What is the value of  $\psi\psi\beta\beta\psi\psi$



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**BTech**  
**BTBS-T-HS-302**

**3<sup>rd</sup> Semester End Semester Examination: 2023-24**

**Subject Name: Engineering Economics**

**BRANCH (Mech, Civil, AG, EEE & ECE): BTech**

**Time: 3 Hour**

**Max Marks: 100**

**Q. Code: BT304**

*Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III  
The figures in the right hand margin indicate marks.*

<b>Part - I</b>				
<b>01</b>	<b>Answer the following questions:</b>		<b>(10 x 2)</b>	<b>CO</b> <b>BTL</b>
	a) What is Nominal interest rate?		4	1
	b) What is Net present value ?		4	1
	c) When the price of a good is Rs 12, consumer buys 24 units when price rises to Rs 34, the consumers buy 20 unit. Calculate Price elasticity of demand?		1	1
	d) What is Cost and Benefit analysis?		4	1
	e) What is discount in bill of exchange?		5	1
	f) Write any two basic Problems of an Economy?		1	1
	g) Write any two exceptions of law of supply?		1	1
	h) What do you mean by Revenue dominated cash flow diagram?		4	1
	i) What is Explicit cost in production?		3	1
	j) What is Comprehensive inflation?		5	1
<b>Part-II</b>			<b>CO</b>	<b>BTL</b>
	<b>Answer any eight questions</b>		<b>(06 x 08)</b>	
<b>02</b>	a) A bank gives a loan to a company to purchase an equipment worth 10,00,000 at an interest rate of 18% compounded annually. This amount should be repaid in 15 yearly instalments. Find the instalment amount that the company has to pay to the bank.		4	2
	b) A company has to replace a machine after 15 years at an outlay of RS 5,00,000. It plans to deposit an equal amount at the end of every year for the next 15 years at an interest rate of 18% compounded annually. Find the equivalent amount that must be deposited at the end of every year for the next year 15 years.		4	2
	c) A person is planning for his retired life. He has 10 more years of service. He would like to deposit RS 8,500 at the end of the first year and thereafter he wishes to deposit the amount with an annual decrease of RS 500 for the next 9 years with an interest rate of 15%. Find the total amount at the end of the 10th year of the above series.		4	2
	d) Explain the causes of Depreciation?		4	2
	e) Explain the degree of price elasticity of demand.		1	2



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	f)	Briefly explain any four causes of inflation.	5	2
	g)	What is Break-even point. Show the Breakeven point with the help of diagram?		2
c	h)	Write short notes on variable cost with diagram.	3	2
	i)	What are the different types of loan provided by the commercial bank.	5	2
C	j)	What are the difference between average cost & marginal cost.	3	2
	k)	What are the difference between short run & long run production function.	2	2
	l)	Write the exception of law of demand.	1	2

**Part-III**

Answer any Two questions from the Q-3 to Q-6 (16 x 2)

			CO	BTL
03	a)	Explain any two methods of measuring price elasticity of demand.	1	3
	b)	Explain the law of supply with limitations.	1	3
04	a)	What is oligopoly Market? Explain the features of Oligopoly.	3	3
	b)	Explain the function of commercial bank.	5	3
05	a)	Consider the following data of a company for the year 2020 Sales =1,20,000 Fixed cost=25,000 Variable cost=45,000 find (i)Contribution (ii)Profit (iii)P/V ratio (iv)BEP (v)MS	4	3
	b)	A company purchased an equipment whose first cost is 1,00,000 with an estimated life of 8 years. The estimate salvage value of the equipment at the end of its life time is Rs 20,000. Find the depreciation and book for the various years by using sum of year digits method of depreciation.	4	3
06	a)	LIC accepts Rs 10,000 at the end of every year for 20 years and pays the investor Rs 8,00,000 at the end of 20th year. Bajaj Allianz accepts RS 10,000 at the end of every year for 20 years and pays the investor 15,00,000 at the end of 25th year. Which is the best alternatives by present worth method with i=12%.	4	3
	b)	A company purchased an equipment whose first cost is 1,00,000 with an estimated life of 8 years .The estimate salvage value of the equipment at the end of its life time is Rs 20,000.Determine the depreciation charge and book value by using declining balance method of depreciation by assuming K=0.2	4	3



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**BTech**  
**BTCS-T-ES-301**

**3<sup>rd</sup>Semester End Semester Examination: 2023-24**

**Subject Name: OOPs using Java**

**BRANCH(S): BTech**

**Time: 3 Hour**

**Max Marks: 100**

**Q. Code: BT317**

**Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III**  
*The figures in the right hand margin indicate marks.*

<b>Part - I</b>				
<b>01</b>	<b>Answer the following questions:</b>	<b>(10 x 2)</b>	<b>CO</b>	<b>BTL</b>
	a) What do you know by java byte code?		1	2
	b) Why is the main method static in Java?		1	2
	c) What happens when a class doesn't contain any constructor? How its data members are initialized?		2	2
	d) Write difference between final and finally keyword in java?		2	2
	e) Differentiate between compile-time and runtime polymorphism.		3	2
	f) Explain equals() and compareTo() methods of String class.		3	2
	g) Find output. String s1="125",s2="251"; int n1=Integer.parseInt(s1),n2= Integer.parseInt(s2); System.out.println(s1+s2); System.out.println(n1+n2+Integer.parseInt(s1+s2));		4	2
	h) Define the term package. Name any 5 java library packages.		4	2
	i) Differentiate between sleep() and wait() method in multithreading in java.		5	2
	j) Explain the role of the "TextField" class in AWT.		6	2
<b>Part-II</b>			<b>CO</b>	<b>BTL</b>
	<b>Answer any eight questions</b>	<b>(06 x 08)</b>		
<b>02</b>	a) Explain instance variables, local variables and argument variables with suitable example.		2	3
	b) Write a java program to print the greatest and smallest of N integers.		1	3
	c) Write a java program that defines a class 'Rectangle' with instance variables for length and width. The class also contains a parameterized constructor and methods to display the instance variables and also a method to compare length and width of a rectangle.		2	4
	d) Write a Java program to calculate the ratio of male to female voters among N voters of class "Voter" with instance variables 'name' and 'gender'.		2	4



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	e)	Write an example program to show constructor overloading in a class 'Employee' with instance variables name and age.	3	3
	f)	Write a Java program that takes a string as input and counts the total number of alphabets, digits and special symbols present in it.	3	4
	g)	Explain the concept of Wrapper classes, boxing and unboxing in java.	4	3
	h)	Provide an example of creating and using a custom package.	4	3
	i)	Define the term "thread priority" in Java. How can you assign and get the priority of a thread.	5	3
	j)	What do you know by thread synchronization? How can you achieve it?	5	3
	k)	How do you use try-catch blocks for handling exceptions in Java?	6	3
	l)	Write a java program to design a Login frame using awt components.	6	3
<b>Part-III</b> <b>Answer any Two questions from the Q-3 to Q-6</b> (16 x 2)				CO      BTL
03	a)	Write a Java program to print the common elements present in two different arrays of integers.	1	3
	b)	Imagine you have an abstract class called "Bank" that offers functionality to determine the rate of interest through the method interest Rate(). Generate subclasses named SBI, ICICI, and AXIS banks. These subclasses should specify interest rates of 8%, 7.5%, and 9%, respectively. Write a java program for it.	2	4
04	a)	Write a program to overload a method sum() as follows: i) int sum(int n)- To calculate and return sum of all multiples of 3 up to n. ii) int sum(int m , int n)- To calculate and return sum of all numbers between m and n which are divisible by 3 or 5.	3	3
	b)	Write a Java program to provide an example of using an interface to achieve multiple inheritances.	3	4
05	a)	Design a frame in java to accept students Name, Roll No, Branch , Year, CGPA and Grade by using Label, text Field and a suitable layout manager.	6	3
	b)	Define inheritance. Explain different types of inheritance by taking real world examples.	4	3
06	a)	Describe the various states a thread can be in during its lifecycle in Java.	5	3
	b)	Write a program to accept a number and print whether or not it is a lead number. A number is said to be a lead number if its sum of even digits is same as sum of odd digits. Eg. 72344 $7+3=2+4+4$	1	3



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**BTech**  
**BTME-T-PC-302**

**3<sup>rd</sup> Semester End Semester Examination: 2023-24**

**Subject Name: Basic Manuf. Practices**

**BRANCH (Mechanics): BTech**

**Time: 3 Hour**

**Max Marks: 100**

**Q. Code: BT319**

**Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III**  
**The figures in the right hand margin indicate marks.**

<b>Part - I</b>				
<b>01</b>	<b>Answer the following questions:</b>	<b>(16 x 2)</b>	<b>CO</b>	<b>BTL</b>
	a) What is the basic principle of metal forming process?	1	2	
	b) Why does a parting sand used in mould making?	1	3	
	c) Define permeability of a moulding sand.	3	2	
	d) Define the function of riser in the gating system.	2	1	
	e) Define the term directional solidification in casting.	6	2	
	f) Which welding process does use a non-consumable electrode?	6	2	
	g) What is the mechanism by which resistance welding joins two metals?	5	2	
	h) Differentiate between press forging and drop forging.	5	1	
	i) What is the difference between blanking and piercing?	3	1	
	j) What are the functions of automation in manufacturing processes?	4	2	
<b>Part-II</b>			<b>CO</b>	<b>BTL</b>
<b>02</b>	<b>Answer any eight questions</b>	<b>(06 x 08)</b>		
	a) Describe different pattern allowances considered in pattern making?	1	5	
	b) Write the different types of moulding sands used in sand moulding.	2	4	
	c) Describe the method of permeability test of moulding sand.	1	5	
	d) Describe the gating system of a mould.	1	1	
	e) Describe different components and their functions in a cupola furnace.	2	2	
	f) Describe the use of different flames in oxy-acetelene gas welding process.	6	3	
	g) Describe the process of arc initiation in arc welding process.	6	2	
	h) Differentiate between brazing and soldering.	6	2	
	i) Write short notes on resistance spot and seam welding.	2	3	
	j) Describe different types of extrusion processes.	2	5	
	k) What are the benefits of integrating computers in manufacturing systems?	5	4	
	l) What is the need of edge preparation in a welding process? Describe different types of edge preparations in butt welding.	5	3	
<b>Part-III</b>			<b>CO</b>	<b>BTL</b>
<b>03</b>	<b>Answer any Two questions from the Q-3 to Q-6</b>	<b>(16 x 2)</b>		
	a) Describe the gating system of a casting process briefing its components and their functions	5	4	
	b) Briefly describe the sand-casting process along with its equipment.	5	4	
<b>04</b>	<b>a) Describe the process of oxy-acetylene gas welding process along with its equipment.</b>	<b>4</b>	<b>5</b>	



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	b)	With neat sketch describe the working principle and components of electron beam welding process.	4	5
05	a)	What do you mean by extrusion? Describe different types of extrusion process with neat sketch.	4	5
	b)	Describe with neat sketch different types of rolling mills used in a rolling process.	2	5
06	a)	Briefly describe computer integrated manufacturing along with its benefits.	3	3
	b)	Briefly describe the basic components of an automated system.	1	3

\*\* BTL: Bloom's Taxonomy Level

\*\* CO: Course Outcomes