

Roll No.

13

TEST CODE: PPAMIN&amp;C SHH

## Question Paper

Instrumentation and Control, General Awareness,  
Reasoning and English

Question Booklet No.

1300442

Time Allowed : 2 Hrs.

Max. Marks : 100

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## INSTRUCTIONS FOR CANDIDATE

1. This Question-Booklet contains 100 Questions on the following :-

Section	Subject	Q. No.	Total Ques.
Part-I	Instrumentation & Control	1-60	60
Part-II	General Awareness, Reasoning and English	61-100	40
Total Questions			100

- There are 16 pages in this Booklet out of which Page No. 1 is for instructions to the candidates. Page Nos. 15 and 16 are meant for Rough Work and page nos. from 2 to 14 contain question of all parts. After opening of the Booklet and before you start answering the questions you must check up this booklet and ensure that it contains all the pages (1-16) and see that no page is missing or repeated. If you find any defect in this booklet, you must get it replaced immediately from the Invigilator within first 10 minutes of start of the Examination.
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- The instructions as given on the OMR Answer-sheet, must be read carefully by the candidate and action in filling up the desired information in the columns writing a statement and marking the answer to the questions by Pen on Side I and Side-II of the OMR Answer-Sheet should be taken accordingly.
- All questions are compulsory. Each question carries one mark. There is **negative marking: 1/4<sup>th</sup> mark** will be deducted for each wrong answer.
- You are required to mark your answers only on the OMR Answer Sheet which has been provided to you separately with **BLACK BALL POINT PEN ONLY**.
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### INSTRUMENTATION & CONTROL

- Q1) The most commonly used filters in SSB generation are :-  
 a) Mechanical      b) RC      c) LC      d) Low-pass
- Q2) If the characteristic equation of a closed loop system is  $s^2 + 2s + 2 = 0$ .  
 Then the system is :-  
 a) over damped      b) critically damped  
 c) under damped      d) undamped
- Q3) In a ratio detector :-  
 a) the linearity is worse than in a phase discriminator  
 b) stabilization against signal strength variation is provided  
 c) the output is twice that obtainable from a similar phase discriminator  
 d) the circuit is the same as in a discriminator, except that the diode are reversed
- Q4) A transducer converts :-  
 a) mechanical energy into electrical energy  
 b) mechanical displacement into electrical signal  
 c) one form of energy into another form of energy  
 d) electrical energy to mechanical energy
- Q5) A resistance potentiometer is a :-  
 a) first order instrument      b) zero order instrument  
 c) second order instrument      d) none of the above
- Q6) One of the following in an active transducer :-  
 a) Strain gauge      b) LVDT  
 c) Photo cell      d) Photo emissive cell
- Q7) Thermo couples are :-  
 a) passive transducers      b) active transducers  
 c) both active and passive transducer      d) output transducer
- Q8) The rotor of a synchro transmitter :-  
 a) uses a salient pole type of construction  
 b) uses a cylindrical pole type of construction  
 c) may use either salient pole or cylindrical type of construction  
 d) none of the above

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- Q9) Capacitive transducers are normally used for :-
- static measurements
  - dynamic measurements
  - both static and dynamic measurements
  - transient measurements
- Q10) Piezo-electric transducers are :-
- passive transducers
  - active transducers
  - inverse transducer
  - active and inverse transducers
- Q11) A true rms reading voltmeter uses two thermocouple in order :-
- to increase sensitivity
  - that a second thermocouple cancels out the non linear effect of the first thermocouple
  - to prevent drift in the d.c. Amplifier
  - all of the above
- Q12) In an electronic ohmmeter an op-amp is used as a :-
- summer
  - multiplier
  - buffer amplifier
  - integrator
- Q13) The primary function of a filter is to :-
- minimize input variations
  - suppress odd harmonics in the rectifier output
  - stabilise DC level of o/p voltage
  - remove ripples from rectified output
- Q14) Saturation region in an NPN transistor :-
- $V_{CB}$  is negative and  $V_{BE}$  is positive
  - $V_{CB}$  is positive and  $V_{BE}$  is negative
  - both  $V_{CB}$  and  $V_{BE}$  are positive
  - both  $V_{CB}$  and  $V_{BE}$  are negative
- Q15) To turn a conducting SCR to off state, it is necessary to make :-
- anode current less than holding current
  - gate current zero
  - anode voltage less than break over voltage
  - gate voltage zero

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- Q16) Which semiconductor device acts like a diode and two transistor :-  
a) SCR      b) Triac      c) UJT      d) Diac
- Q17) Transformer coupling is used in class A amplifier to make it :-  
a) more efficient      b) less bulky  
c) less costly      d) distortion free
- Q18) Which of these is a thick-film resistor :-  
a) wire wound resistor      b) carbon composition resistor  
c) metal film resistor      d) cermet film resistor
- Q19) Which of these is not a photoelectric device ?  
a) Photoconductive cells      b) Photoemissive cells  
c) Photoresistive cells      d) Photovoltaic cells
- Q20) Which of these represent short in a series circuit ?  
a) Increase in resistance      b) Increase in current  
c) Increase in voltage      d) Increase in conductance
- Q21) Superposition theorem stays valid for a :-  
a) LTI system      b) Discrete system  
c) LT systems      d) None of these
- Q22) Condition for critical damping of a RLC circuit is :-  
a)  $R = \frac{\sqrt{L}}{C}$       b)  $R = \frac{L}{C}$       c)  $R = \frac{1.5\sqrt{L}}{C}$       d)  $R = \frac{2\sqrt{L}}{C}$
- Q23) Active High pass filters consist :-  
a) RC circuits      b) Differential amplifiers  
c) Operational amplifiers      d) RLC circuits
- Q24) Which amongst the following has a negative coefficient of temperature for resistance ?  
a) Copper      b) Lead      c) Carbon      d) Aluminium
- Q25) A flasher circuit application is a :-  
a) Safety blinkers for bicycles      b) Rides lighting  
c) Street Light Control      d) Glow lamp

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Q26) The Kirchoff's law for a.c. is applicable upon consideration of:-

- a) Phasor sum
- b) Algebraic sum
- c) Progression sum
- d) Linear sum

Q27) Methods of earthing not followed in practice are:-

- a) Pipe or Rod earthing
- b) Plate earthing
- c) Disc earthing
- d) None of these

Q28) Which of these is not a semiconductor?

- a) Si
- b) Germanium
- c) Tungsten
- d) None of these

Q29) Which of this represent the half-time constant?

- a) 0.693 T
- b) 0.504 T
- c) 0.876 T
- d) 0.450 T

Q30) When a pure inductor is connected in series with a lamp circuit, effect is:-

- a) Dimmer
- b) Brighter
- c) Same
- d) Fused

Q31) A 2200 V, 50 Hz AC supply signifies that RMS value of AC voltage waveform is:-

- a)  $2200\sqrt{2}$  V
- b)  $(2200\sqrt{2})$  V
- c) 2200 V
- d) None of the above

Q32) A coil has self resistance of 5 ohm ( $\Omega$ ) and  $X_L = 1000 \Omega$  at a resonant frequency of 1 MHz. The value of Q is:-

- a) 200 ohm
- b) 100 ohm
- c) 400 ohm
- d) 300 ohm

Q33) The following should be considered while selection a transducer:-

- a) Sensitivity
- b) Operating Range
- c) Frequency Response
- d) All the above

Q34) An aquadog is used in a 'CRO' to collect:-

- a) Secondary emission electrons
- b) Primary emission electrons
- c) Both Primary and Secondary emission electrons
- d) None of the above

- Q35) The effective resistance of a coil at high frequency is more than its dc resistance on account of :-
- a) Skin effect
  - b) Proximity effects
  - c) Eddy current losses
  - d) All the above
- Q36) The input voltage to an OP AMP is a large voltage step. The output is an exponential waveform that changes to 0.25 V in 0.1  $\mu$ s (microsecond). The slew rate of the OPAMP is :-
- a) 5 V/ $\mu$ s
  - b) 2.5 V/ $\mu$ s
  - c) 3 V/ $\mu$ s
  - d) 4.5 V/ $\mu$ s
- Q37) Data Acquisition system are used to measure and record analog signal in different ways i.e. :-
- a) Signals which originates from direct measurement of electrical quantities.
  - b) Signals which originate from the use of transducer.
  - c) Signals which oscillates in simple harmonic motion and dies out slowly.
  - d) Both (a) and (b).
- Q38) The sweep width in CRO is controlled by :-
- a) Horizontal Gain Control
  - b) Vertical Gain Control
  - c) Accelerating - Anode Potential Control
  - d) Focussing Anode Potential Control
- Q39) Sampling theory finds its application in :-
- a) Amplitude Modulation
  - b) Frequency Modulation
  - c) PCM
  - d) Phase Modulation
- Q40) A toothed type Tacho-generator has 60 teeth. A magnetic pickup is used in conjunction with it. The number of pulses generated per second in the magnetic pick up is :-
- a) 3000
  - b) 1500
  - c) 1800
  - d) 1200
- Q41) Dummy strain gauges are used for :-
- a) compensation of temperature changes
  - b) increasing the sensitivity of bridge in which they are included
  - c) compensating for different expansion
  - d) calibration of strain gauge

Q42) When measuring strain, ballast circuit use a capacitor to act as a high pass filter. This is done when :-

- a) Static strain are being measured
- b) Dynamic strain are being measured
- c) Both Static and dynamic strain are being measured
- d) None of the above

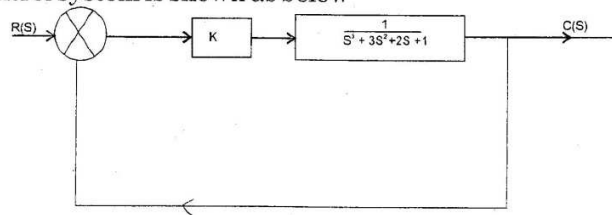
Q43) A floating point number consist of :-

- a) A mantissa only
- b) Base only
- c) An exponent only
- d) all the above

Q44) The purpose of the series quadrature windings in an Amplidyne :-

- a) Neutralize the effect of Armature Reaction
- b) Reduce commutation difficulties
- c) Increase the gain
- d) Increase the response time

Q45) A control system is shown as below



The maximum value of gain 'K' for which system is stable is :-

- a)  $\sqrt{3}$
- b) 3
- c) 4
- d) 5

Q46) The 1<sup>st</sup> order system given by  $G(s) = \frac{15}{3s + 1}$

The open loop gain and time constant of the above system :-

- a) 15, 3
- b) 5, 0.33
- c) 5, 2
- d) 0.5, 0.75

Q47) The Transfer Function of a system is given by  $G(s) = \frac{9}{s^2 + 4s + 9}$

The impulse response of the above system is :-

- a)  $4.025 e^{-2t} \sin 2.236 t$
- b)  $4.025 e^{-t} \cos 2.236 t$
- c)  $2.025 e^{-4t} \cos 2.236 t$
- d)  $4.50 e^{-2t} \sin 4.472 t$

Q48) If 'x' is the input and 'y' is the output the system described by a differential equation  $\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 8y = 8x$

Then damping ratio of the above system is given by :-

- a)  $1/\sqrt{2}$       b)  $\sqrt{2}$       c)  $\sqrt{3}$       d)  $1/\sqrt{3}$

Q49) The PID controller consist of :-

- a) A Passive mode, an Infinity mode, a Different mode  
b) A Proportional mode, A Integral mode, A Derivative mode  
c) A Positive mode, A Inductive Mode, A Directional mode  
d) All the above

Q50) A system whose Open Loop Transfer Function is given by :-

$$G(S)H(S) = 200 / (S^2 + 20S + 200)$$

The type and order of the above system is :-

- a) 0, 2      b) 2, 2      c) 1, 2      d) 2, 1

Q51) The velocity error constant ( $K_v$ ) in Time domain analysis of control system is given by :-

- a)  $K_v = \lim_{S \rightarrow 0} S G(S)H(S)$       b)  $K_v = \lim_{S \rightarrow 0} S^2 G(S)H(S)$   
c)  $K_v = \lim_{S \rightarrow 0} S^2 G(S)H(S)$       d) None of the above

Q52) A digital voltmeter uses an A/D converter which needs a start pulse, uses an analog comparator and has a relatively fixed conversion time independent of the applied voltage. The A/D converter is :-

- a) Successive Approximation Converter      b) Digital Ramp Converter  
c) Digital Slope Converter      d) All the above

Q53) X-Y recorders

- a) Record one quantity with respect to other quantity  
b) Record one quantity on X axis with respect to time on Y axis  
c) Record one quantity on Y axis with respect to time on X axis  
d) Both (b) and (c)

Q54) The modulation index of a FM Signal having modulating frequency 2 KHz and Max deviation is 10 KHz, is :-

- a) 2      b) 5      c) 3      d) 4



- Q55) The closed loop gain of an OP AMP is dependent upon, whether the OP AMP is used :-
- in inverting mode
  - in non-inverting mode
  - is independent of the fact whether the input is connected to inverting or non-inverting terminal
  - is depending upon the fact whether the input is connected to inverting or non-inverting terminal
- Q56) Which is not the disadvantage of LVDT?
- Relatively large displacement are required for appreciable differential output
  - temperature affects the performances of transducer
  - low hysteresis and electrical isolation
  - the dynamic response is limited mechanically by the mass of the core and electrically by the frequency of applied voltage
- Q57) The emf produced in thermo couple circuit is given by :-
- $E = a(\Delta\theta)^2 + b(\Delta\theta)^3$
  - $E = a(\Delta\theta) + b(\Delta\theta)^2$
  - $E = a(\Delta\theta) + b(\Delta\theta)^3$
  - $E = a^2(\Delta\theta) + b^2(\Delta\theta)^2$
- where  $\Delta\theta$  = difference in temperature between hot thermo couple junction and reference junction of thermo couple in  $^{\circ}\text{C}$ . a, b = Constant
- Q58) If the Q factor of a coil which is  $(w_p L) / R$  is measured by varying frequency :-
- The plot between Q and frequency is Linear
  - The value of Q initially decreases with increase in frequency and afterwards increases with increase of frequency
  - The value of Q initially increases with increase in frequency and afterwards decreases with the increase of frequency
  - The Q factor remains constant irrespective of the value of frequency
- Q59) Electronic Voltmeters which use rectifiers employ negative feedback. This is done :-
- To increase the overall gain
  - To improve stability
  - To overcome non-linearity of the diodes
  - None of the above
- Q60) Maxwell's inductance - capacitance bridge is used for measurement of Inductance of :-
- Low Q coils
  - Medium Q coils
  - High Q coils
  - Low and medium Q coils

GENERAL KNOWLEDGE

- Q61) Sun Temple is situated at :-  
a) Haridwar  
b) Vrindavan  
c) Kanyakumari  
d) Konark
- Q62) The first Railway line in India was started in :-  
a) 1828  
b) 1835  
c) 1853  
d) 1883
- Q63) Bhopal disaster was the result of :-  
a) Collapsing of a dam  
b) Great fire  
c) Plague epidemic  
d) Leakage of gas
- Q64) Which of the following countries is not a member of the SAARC countries?  
a) Bangladesh  
b) Afghanistan  
c) Pakistan  
d) Nepal
- Q65) Mallika Sarabhai is associated with which of the following fields :-  
a) Social Service  
b) Classical Music  
c) Classical Dance  
d) Sports
- Q66) Who wrote the book "Discovery of India"?  
a) Mahatma Gandhi  
b) Dr. Rajendra Prasad  
c) Jawaharlal Nehru  
d) R.K. Narayan
- Q67) India's first satellite launching station is located at :-  
a) Chennai  
b) Ahmedabad  
c) Thumba  
d) Sriharikota
- Q68) Which of the following is the smallest city (area wise) in the world?  
a) Cuba  
b) Japan  
c) Grenoila  
d) Vatican City State

Q69) In India, Teacher's Day is celebrated on :-

- a) November 14                      b) January 30  
c) September 5                      d) October 10

Q70) People from which state celebrate their harvest around Makar Sakranti :-

- a) Andhra Pradesh                      b) Kerala  
c) Karnataka                      d) Bangalore

Q71) Complete the number series by choosing the correct alternative :

Series : 1, 2, 4, 7, 11, 16, .....

- a) 20                      b) 21                      c) 22                      d) 24

Q72) The numbers in the following squares are filled on the basis of some rule or analog. Complete the blank square by choosing the correct number from the alternatives :-

9	?	4
36	1	16
25	49	25

- a) 2                      b) 3                      c) 66                      d) 64

Q73) If in a code GATE is written as ICVG, how can RAT will be written in that code :-

- a) UCV                      b) QZS                      c) TCV                      d) SBU

Q74) Doctor : Diagnosis :: Judge : ?

- a) Court                      b) Punishment                      c) Lawyer                      d) Judgement

Q75) Choose the odd man out :-

- a) Physics                      b) Chemistry                      c) Botany                      d) Biology

Q76) If in certain code the word HAT is written as 29, what will be the code for RAT ?

- a) 40                      b) 39                      c) 42                      d) 37



## PPAMIN&amp;C SIII

- Q82) He woke up at dawn because .....
- a) he wanted to study                      b) he wanted to pray  
c) he had to go to school                  d) he wanted to play cricket
- Q83) The other thing on his mind was .....
- a) one or two games of cricket              b) to study history  
c) to study algebra                          d) his mother's love of cricket
- Q84) He did not want to study history because .....
- a) he loved to study algebra  
b) he had no interest in history  
c) he wanted to become a cricket player  
d) his mother was a cricket fan
- Q85) Even a cricket player needs maths to .....
- a) calculate his batting averages  
b) calculate the fee he gets for playing  
c) calculate the daily expenses in his life  
d) become part of history

Directions ( Q 86 – 90 ) : Complete the sentences given below with the help of options that follow each sentence.

- Q86) Honesty is ..... best policy.
- a) a                      b) an                      c) the                      d) no article
- Q87) Here is ..... rupee for you.
- a) a                      b) an                      c) the                      d) no article
- Q88) She is very fond ..... me.
- a) on                      b) of                      c) in                      d) the
- Q89) I am unanswerable ..... my officer.
- a) with                      b) into                      c) of                      d) to
- Q90) The car ran ..... an old dog.
- a) on                      b) into                      c) over                      d) up

Direction ( Q. 91 – 95 ) : Out of the four alternatives choose the word / phrase that is most nearly the same in meaning as the given word :

Q91) FAITHFUL

- a) disobedient      b) loyal      c) lawless      d) rebellious

Q92) REPLY

- a) answer      b) ask      c) inquire      d) examine

Q93) SOIL

- a) sky      b) village      c) earth      d) sea

Q94) TEACH

- a) guide      b) follow      c) learn      d) imbibe

Q95) UNEASY

- a) disturbed      b) calm      c) content      d) quiet

Direction ( Q 96 – 100 ) : Out of the four alternatives choose the word that is most nearly the opposite to the given word :

Q96) HAPPY

- a) serious      b) silent      c) bored      d) sad

Q97) SMOOTH

- a) risky      b) rough      c) dangerous      d) fatal

Q98) ARRIVAL

- a) return      b) coming      c) departure      d) meet

Q99) REWARD

- a) harmless      b) punishment      c) coward      d) rule

Q100) CHEAP

- a) costly      b) less      c) enough      d) sufficient

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S.No.	Answers	S.No.	Answers	S.No.	Answers	S.No.	Answers
1	A	26	A	51	B	76	B
2	C	27	C	52	A	77	D
3	A	28	C	53	A	78	C
4	C	29	A	54	B	79	D
5	B	30	A	55	D	80	C
6	C	31	C	56	C	81	B
7	B	32	A	57	B	82	D
8	A	33	D	58	C	83	A
9	B	34	A	59	C	84	C
10	D	35	D	60	B	85	A
11	B	36	B	61	D	86	C
12	C	37	D	62	C	87	A
13	D	38	A	63	D	88	B
14	A	39	C	64	B	89	D
15	A	40	* A Bonus	65	C	90	C
16	C	41	A	66	C	91	B
17	A	42	B	67	C	92	A
18	D	43	D	68	D	93	C
19	C	44	C	69	C	94	A
20	B	45	D	70	D	95	A
21	A	46	A	71	C	96	D
22	A	47	A	72	D	97	B
23	C	48	A	73	C	98	C
24	C	49	B	74	D	99	B
25	A	50	A	75	C	100	A

Q no 40 - Bonus Mark,

