1) **C language**
   a) Explain compilation stages of C
   b) How many keywords are in C, what are those? - 32
   c) Explain storage classes of C with its scope & life
   d) Explain memory layout of C
   e) What is data type and how many data types in C
   f) What is Typedef, Typecasting & Enumeration
   g) What is little & big endian
   h) What is Volatile & Constant
   i) What is volatile constant
   j) What is pointer & explain types of pointer
   k) Can we do arithmetic operations on pointer
   l) If ptr is pointer , then what is output for *ptr++,++*ptr,*ptr--,--*ptr.
   m) Can pointer can points to another data type variable.
   n) What is constant pointer & pointer to constant , what is function pointer?
   o) What is dynamic memory allocation
   p) What is difference between structure & Union
   q) What is structure padding & structure packing
   r) What is memory leak?
   s) Programming questions on swapping number using pointer,without pointer.
   t) Programming questions on bit wise operator
      i) Set a bit
      ii) Clear a bit
      iii) Toggle a bit
      iv) Multiplication of two number using bitwise operator
      v) Table of number using bitwise operator
      vi) Find even or odd number using bitwise number
      vii) Right shift of number
      viii) Left shift of number
   u) Programming questions on string with its functions(strcat,strcpy,strlwr,strupr,strrev,strlen)
   v) Programming questions for string functions with own logic(strcat,strcpy,strlwr,strupr,strrev,strlen).
   w) Programming question on Fibonacci series
   x) Programming question on Fibonacci series using array
   y) Programming question on Factor of number using recusrion

z) Programming questions on Macros

1. W.A.P. for turnery operator using Macros
2. W.A.P. for any function(e.g.SUM) using Macros
3. SET,CLEAR & TOGGLE using macros
4. What is meaning of #if 0
5. What is meaning of #if 1
6. Which are Conditional MACROS , how they are used.

aa)Programming questions on structure & structure pointer

bb)
```
int fuc(int *a)
{
*a+=10;
return *a;
}
void main()
{
 Int b=20,c;
C=func(&b);
printf("%d",c);
}
```
What is output of above code?

cc) what is meaning of if(0) & if(1)

dd) Programming for dynamic memory allocation for single dimensional & multidimensional array.

ee) Program to implement without main function

ff) Program to convert number decimal to binary,hex,ocatal.

gg) Program to convert number binary to decimal,hex,octal

hh)Program to convert number octal to decimal,binary,hex

ii) Program to convert number hex to decimal,hex,octal

2) **Embedded Questions**

A) General questions

a) What is Embedded System?

b) What is difference between Microprocessor & Microcontroller

c) What is RISC & CISC architecture , give difference

d) What is von-neuman & harward architecture

e) What is data bus ,address bus & control bus of uC?

f) If microcontroller is 8/16/32 bit, what is data bus length of uC?

g) What is use of stack pointer, programming counter & data pointer register

h) What is Control register, Data Register & status Register

i) Expalin feature of uC(which is you worked on)

j) Expalin architecture of uC(which is you worked on)

k) What is AHB & APB bus in ARM architecture

l) What is use of GPIO pins.

m) Explain different timers of uC[Basic,General Purpose,Advance,Watchdog Timer]

n) Explain Counter concept.

o) Explain ADC concept of uC.Formula for ADC count

p) Explain DAC concept of uC. Formula for ADC count

q) Explain RTC concept.

r) Explain PWM concepts

B) <u>UART questions:-</u>

i) What is UART?

ii) Draw wiring diagram of UART

iii) Is UART is Asynchronous or Synchronous , difference between it.

iv) What is baud rate?

v) What is frame structure of UART

vi) Is UART Simplex, Full Duplex or Half Duplex

vii) How many byte of data can be send using UART.

C) <u>I2C questions:-</u>

i) What is I2C?

ii) Draw wiring diagram of I2C

iii) Why pull up resistors are used in I2C wiring diagram

iv) What is frame structure of I2C

v) How many master & slaves in I2C

vi) Is I2C is Asynchronous or Synchronous

vii) Is I2C Simplex, Full Duplex or Half Duplex

viii) How many devices can we connect using I2C bus?

ix) What is arbitration in I2C?

x) What is Clock stretching in I2C?

xi) What is speed of I2C

D) <u>SPI questions:-</u>

i) What is SPI?

ii) Draw wiring diagram of SPI

iii) What are modes of SPI

iv) What is CPOL & CPHASE in SPI

v) What is speed of SPI

vi) Which is best protocol between I2C & SPI ,why?

vii) Is I2C is Asynchronous or Synchronous

viii) Is I2C Simplex, Full Duplex or Half Duplex

ix) How many master & slaves in SPI

E) **CAN questions:-**

i) What is CAN?
ii) What is Standard f CAN?
iii) What is Current version of CAN?
iv) Why we used CAN?
v) What are properties of CAN?
vi) What are the types of CAN?
vii) What is dominant & recessive bit in CAN?
viii) In which layer CAN works?
ix) Draw wiring diagram of CAN?
x) What is Wire And Logic in CAN?
xi) Why 120Ω resistor used in termination of CAN bus?
xii) What is bit stuffing & destuffing in CAN?
xiii) Explain Arbitration process in CAN bus.
xiv) Explain different frame of CAN.
xv) Explain error types of CAN.
xvi) What is role of CAN Controller & CAN Transducers?
xvii) What are error states of CAN?
xviii) How to overcome bus off state?
xix) What is Synchronization in CAN? Why its need?
xx) What are types of Synchronization Types?
xxi) What is Bit Time?
xxii) Explain Bit Time Segments, explain sample point & information processing time?
xxiii) Explain edge error phase.
xxiv) Why there is need of bit Lengthening & Shortening.
xxv) What is CANTP?
xxvi) Why CANTP is needed in communication?
xxvii) What is ISO standard of CANTP?
xxviii) Explain Channels of CANTP.
xxix) Explain different frames of CAN.
xxx) What is maximum number of bytes data can be send using CANTP.
xxxi) Explain working of CANTP if data is 50 bytes.
xxxii) Explain CAN Timers.

2) **AUTOSAR Tools questions**

a) Which are Project Requirement Tools, explain IBM DOORS & IMB RHAPSODY.

b) Which is Project management Tool, explain JIRA Tool.

c) Which are version control tools, explain PTC & Github.

d) What are debuggers tools, explain hardware & software debugging connection diagram.

e) What is Unit Testing?

f) What is Integration Testing?

g) What are Testing Tools.

i) CANdB++ , CANoe & CAPL programming Questions :-

(1) Why we use CAndB++?

(2) What is current version of CANdB++?

(3) What is reference file of CANdB++?

(4) What configuration done in CANdB++?

(5) What is output of CANdB++?

(6) Explain process of configuration in CANdB++.

(7) Why CANoe tool is used?

(8) What is current version of CANoe tool.

(9) What is IG block?

(10) Can we receive message using CANIG block?

(11) How to use .dbc file in CANoe, what is purpose of that?

(12) What is CAN hardware name & why it is used?

(13) Draw connection diagram for debugging using Canoe.

(14) What are triggering methods in Canoe?

(15) What is use of Trace window in Canoe?

(16) How to use Signal Generator for message?

(17) How to check periodicity of two signal?

(18) What is CAPL programming, why we use that?

(19) In which IDE CAPL programming is written?

13.What happen if PDUR is not configured?
14.What is use of AUTOSAR COM?
15.Explain COM filter in AUTOSAR COM configuration
16.Explain Tranfer properties in AUTOSAR COM configuration.
17.Explain COMTxPDUMode in AUTOSAR COM configuration.
18.Explain signal & pdu gateway mapping.
19. What is use of RTE layer
20. What are types of software components?
21. Which ports are used to connect different software component?
22.Explain Types of Port Interfaces.
23. Explain RTE configuration steps & creation of software components in Davinci Developer or Autosar Builder.
24. What is DCM module,explain data & control flow of DCM.
25.Explain layers of DCM.
26. Give DCM configuration[CAN Driver,CANif,CANTP,PDUR,DSL,DSD,DSP] in EBtresos or Davinci configurator.
27. What is P2 Timer, P2 * Timer & S3 Timer.
28.Which protocol are used for diagnostic.
29.What is UDS protocol , give its standard. – 14229
30.Which services provided by UDS protocol. – Read DTC – 19, clear DTC – 14 control DTC setty = 85
31.What are different NRC's in dignostics?
32.Which services are used in Default & extended session. – Diagnostic session con – 10
33.Can we use programming session using diagnostic?
34. What happen if seed is resend after unlocking the ECU?
35. Use cases with request & response[positive & negtaive] for all services.
36.Use case for dignostic ECU by using all services step by step.
37.What is DEM module, what is use of it?
38.What is Dignostic Event?
39.What is Dignostic Trouble Code[DTC]?
40.Explain DTC status byte.
41.How DCM will get DTC information?
42.What is Freeze Frame or Snapshot data?
43.What is extended data?
44. What is Dignostic Data Identifier?
45. When snapshot data need to store into memory , from where it is collected?
46. What is Event Aging?

(20) Using CAPL , what are different triggers ?
(21) What us timer & mstimer variable in CAPL program?
(22) Can we give delay between two bytes in CAN frame?
(23) Can we send data byte by byte?
(24) What is include file in CAPL program?
(25) Test ECU by creating CANIG block , follow all steps.
(26) Test ECU by taking .dbc file ,follow all steps.
(27) Test ECU using CAPL programming.
(28) What is use of "logging" in measurement window?
(29) Explain process of "logging".
(30) How many number of channels we configured in Canoe & what is baud rate .
(31) What are preconditions to use Canoe.

ii) Vector Cast
(1) What is use of Vector cast?
(2) Explain steps of testing using vector cast.
(3) What is input file & output file of vector cast.
(4) Which reports are generated using vector cast.

e) What is use of Davinci Developer & Autosar Builder, explain the steps.
f) What is use of Davinci Configurator & EBtresos configuratior.
g) Explain all input & output files for all tools.

3) **AUTOSAR Questions**

1. What is AUTOSAR?
2. Why AUTOSAR is used in Automotive industry?
3. What are types of AUTOSAR?
4. What are objective of AUTOSAR?
5. What are Advantages, disadvantages & Applications of AUTOSAR?
6. Explain Software Development Life Modules(water fall maodel, V model & Agile metododlogy)
7. What is difference between water fall model & v mdoel?
8. Explain Architecture of AUTOSAR.
9. What is COM stack , explain its data & control flow with APIs?
10. Give COM stack configuration[CAN Driver, CANIf, PDUR, AUTOSAR COM,RTE] in Ebtresos or davinci configurator.
11. What is controller ID & controller base address?
12. What is basic & full CAN?

47. Explain DTC counters
48. What is fault memory?
49. What is inter & intra communication.
50. What is deadline monitoring?
51. Give configuration for DEM module[NVRAM Block List, Operation Cycle List, Aging cycle List, DEM Config Set]