



WINTER- 17 EXAMINATION

Model Answer

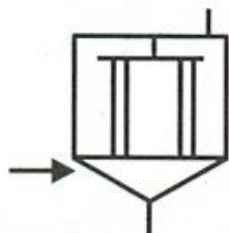
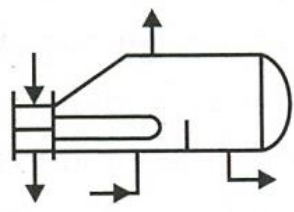

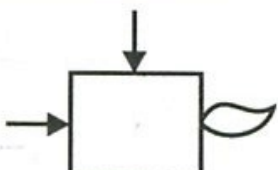
Subject Name: Chemical Engineering Drawing

Subject Code:

17647

**Important Instructions to examiners:**

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q. No.	Sub Q. N.	Answer	Marking Scheme
1	A	Attempt any three	12
	a	<b>Bag Filter</b>  <b>Kettle type reboiler</b> 	2+2
	b	<b>Autoclave,</b>  <b>Burner</b> 	2+2



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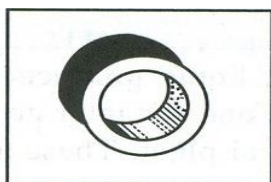
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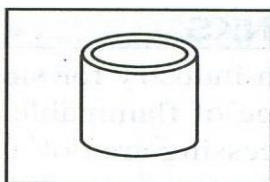
17647

c Packings used in packed tower:(any 2)

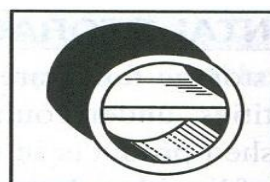
2 marks  
each for  
any two



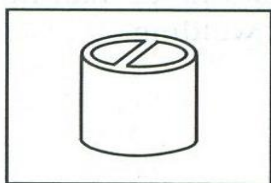
Raschig Ring



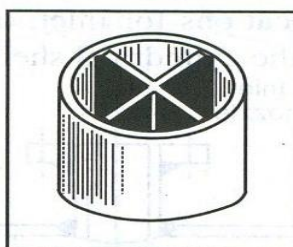
Raschig Ring



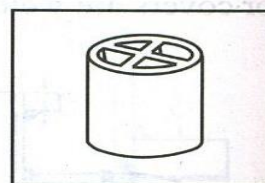
Lessing Ring



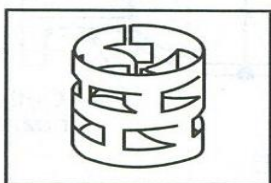
Lessing Ring



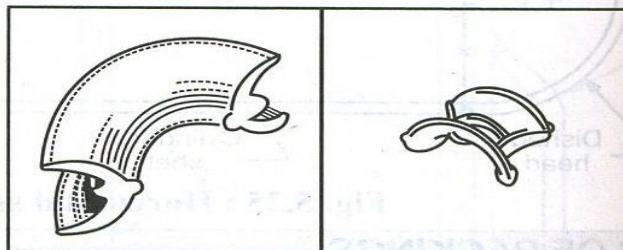
Cross partition Ring



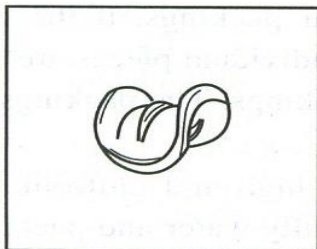
Cross partition Ring



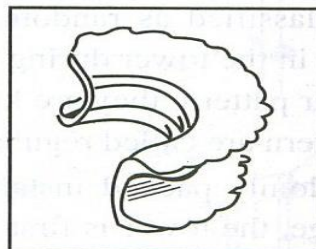
Pall Ring



Intalox saddle



Berl saddle



Super Intalox packing



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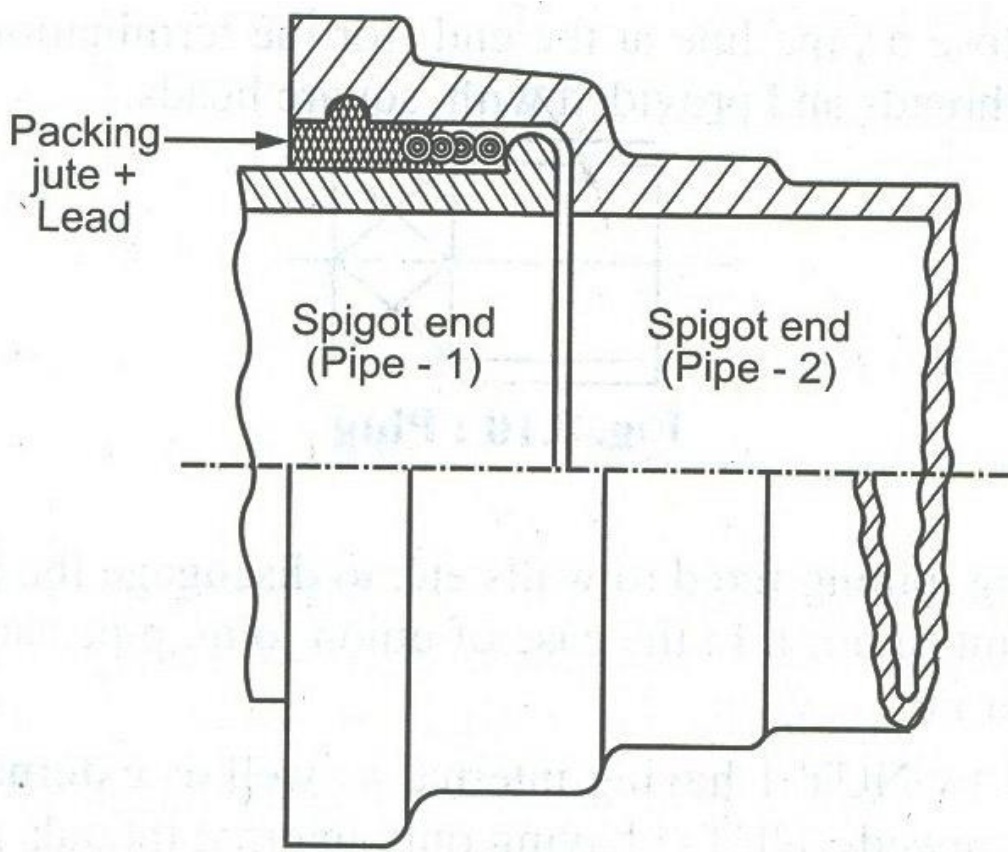
Model Answer

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d Socket and Spigot joint



4



WINTER- 17 EXAMINATION

Model Answer

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1	B	Attempt any one	8																																																																																																																																				
	a	<div>Specification sheet for heat exchanger</div> <table><tr><td>1.</td><td>Specification No. ....</td><td>Date .....</td></tr><tr><td>2.</td><td>Number required .....</td><td>Location .....</td></tr><tr><td>3.</td><td>Type .....</td><td>Duty as .....</td></tr><tr><td>4.</td><td colspan="2">Operating data/conditions</td></tr><tr><td>5.</td><td>Fluid description</td><td>Shell side</td><td>Tube side</td></tr><tr><td>6.</td><td>Name</td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>7.</td><td>Composition</td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>8.</td><td>Flow rate, kg/h</td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>9.</td><td>Density, kg/m<sup>3</sup></td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>10.</td><td>Viscosity, cP</td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>11.</td><td>Specific heat,</td><td>.....</td><td>.....</td></tr><tr><td>12.</td><td>Latent heat, kcal/kg</td><td>.....</td><td>.....</td></tr><tr><td>13.</td><td>Thermal conductivity</td><td>.....</td><td>.....</td></tr><tr><td>14.</td><td>Temperature, °C</td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>15.</td><td>Operating pressure, kgf/cm<sup>2</sup>.g</td><td>In ... out ...</td><td>In ... out ...</td></tr><tr><td>16.</td><td>No. of passes</td><td>.....</td><td>.....</td></tr><tr><td>17.</td><td>Velocity, m/s</td><td>.....</td><td>.....</td></tr><tr><td>21.</td><td colspan="3">Tube : OD ..... mm, length ..... m, wall thickness (BWG) ..... pitch ..... mm <input type="checkbox"/> Δ material .....</td></tr><tr><td>22.</td><td colspan="3">Shell : Nom. OD ..... length ..... mm thickness .....</td></tr><tr><td>23.</td><td colspan="3">Shell cover : ..... Material .....</td></tr><tr><td>24.</td><td colspan="3">Channel ..... Channel cover .....</td></tr><tr><td>25.</td><td colspan="3">Tube sheet type ..... (stationary/floating)</td></tr><tr><td>26.</td><td colspan="3">Baffles : type ..... No. .... Thickness .....</td></tr><tr><td>27.</td><td colspan="3">Shell side nozzles : Inlet ..... outlet ..... drain .....</td></tr><tr><td>28.</td><td colspan="3">Tube side nozzles : Inlet ..... outlet .....</td></tr><tr><td>29.</td><td colspan="3">Corrosion allowance : shell side ..... tube side .....</td></tr><tr><td>30.</td><td colspan="3">Gaskets .....</td></tr><tr><td>31.</td><td colspan="3">Design code .....</td></tr><tr><td>32.</td><td colspan="3">Design pressure and temperature   ... kgf/cm<sup>2</sup>.g, ..... °C   ... kgf/cm<sup>2</sup>.g, ..... °C</td></tr><tr><td>33.</td><td colspan="3">Test pressure and temperature ....., ....., ....., .....</td></tr><tr><td>34.</td><td colspan="3">Weight : Dry ....., Tube bundle ..... Unit full of water ..... kg.</td></tr><tr><td>35.</td><td colspan="3">Remarks .....</td></tr><tr><td></td><td colspan="3">Prepared by ..... Checked by ..... Approved by .....</td></tr><tr><td></td><td colspan="3">Name and Address .....</td></tr></table>	1.	Specification No. ....	Date .....	2.	Number required .....	Location .....	3.	Type .....	Duty as .....	4.	Operating data/conditions		5.	Fluid description	Shell side	Tube side	6.	Name	In ... out ...	In ... out ...	7.	Composition	In ... out ...	In ... out ...	8.	Flow rate, kg/h	In ... out ...	In ... out ...	9.	Density, kg/m <sup>3</sup>	In ... out ...	In ... out ...	10.	Viscosity, cP	In ... out ...	In ... out ...	11.	Specific heat,	.....	.....	12.	Latent heat, kcal/kg	.....	.....	13.	Thermal conductivity	.....	.....	14.	Temperature, °C	In ... out ...	In ... out ...	15.	Operating pressure, kgf/cm <sup>2</sup> .g	In ... out ...	In ... out ...	16.	No. of passes	.....	.....	17.	Velocity, m/s	.....	.....	21.	Tube : OD ..... mm, length ..... m, wall thickness (BWG) ..... pitch ..... mm <input type="checkbox"/> Δ material .....			22.	Shell : Nom. OD ..... length ..... mm thickness .....			23.	Shell cover : ..... Material .....			24.	Channel ..... Channel cover .....			25.	Tube sheet type ..... (stationary/floating)			26.	Baffles : type ..... No. .... Thickness .....			27.	Shell side nozzles : Inlet ..... outlet ..... drain .....			28.	Tube side nozzles : Inlet ..... outlet .....			29.	Corrosion allowance : shell side ..... tube side .....			30.	Gaskets .....			31.	Design code .....			32.	Design pressure and temperature   ... kgf/cm <sup>2</sup> .g, ..... °C   ... kgf/cm <sup>2</sup> .g, ..... °C			33.	Test pressure and temperature ....., ....., ....., .....			34.	Weight : Dry ....., Tube bundle ..... Unit full of water ..... kg.			35.	Remarks .....				Prepared by ..... Checked by ..... Approved by .....				Name and Address .....			8
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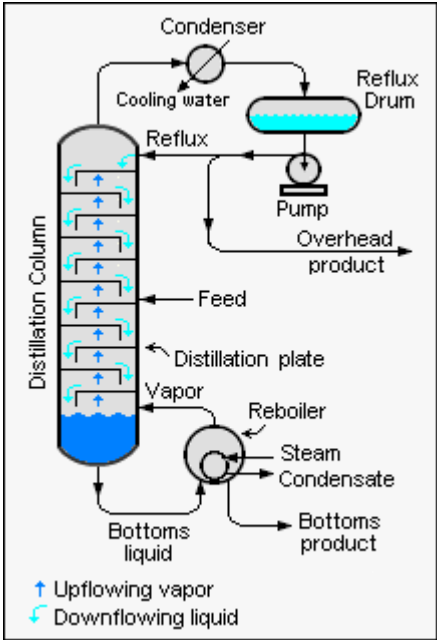
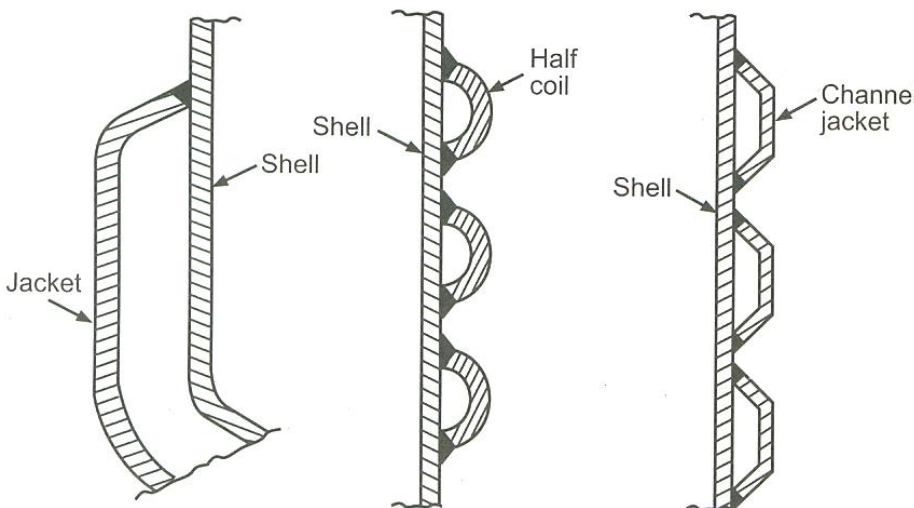
WINTER- 17 EXAMINATION

Model Answer

Subject Name: Chemical Engineering Drawing

Subject Code:

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1	b	<b>Distillation column</b> 	8
2		<b>Attempt any four</b>	<b>16</b>
2	a	<b>Jackets: (any 2)</b> 	2 marks each



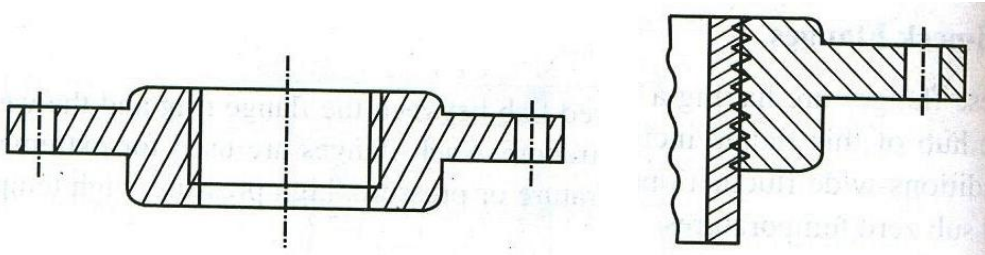
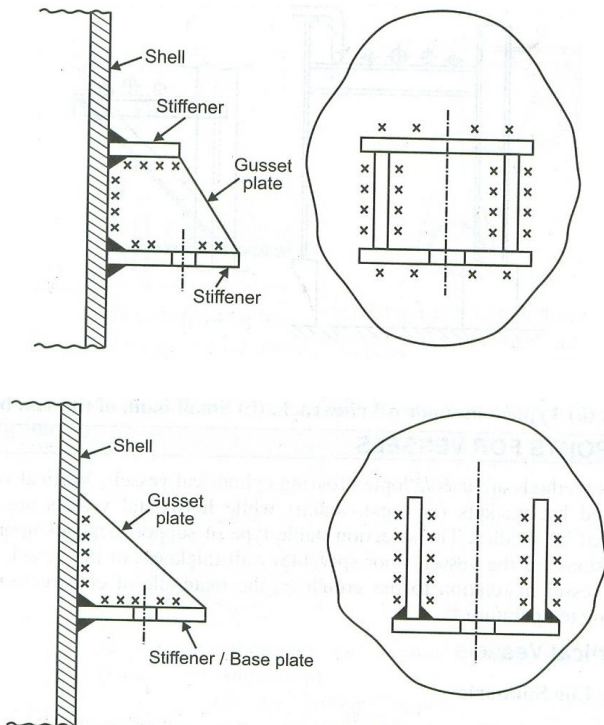
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2	b	<b>Screwed flange</b> 	4
2	c	<b>Bracket support</b> 	4

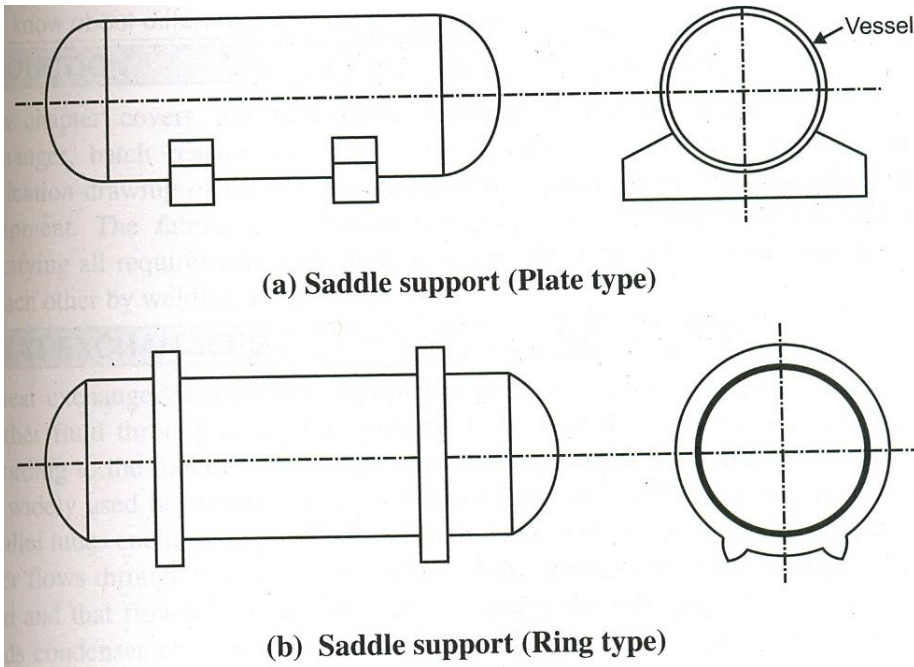
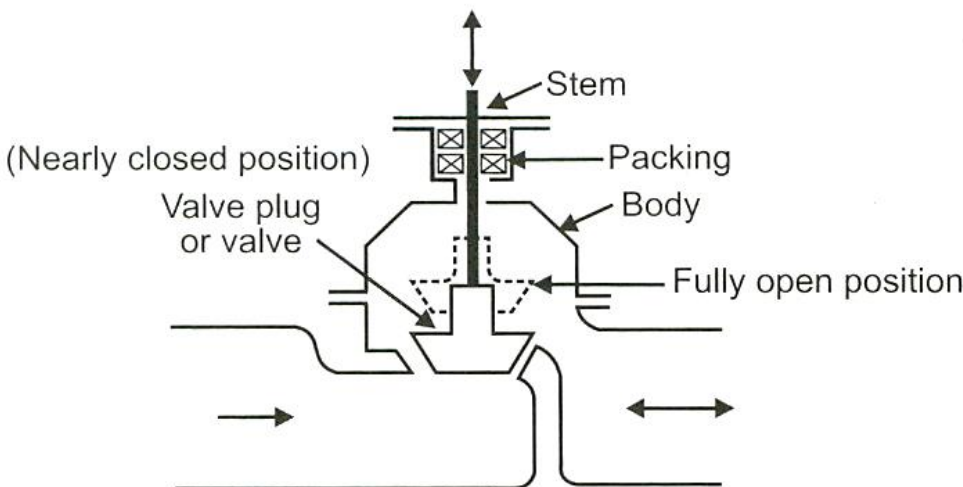
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2	d	<p><b>Saddle support</b></p>  <p>(a) Saddle support (Plate type)</p> <p>(b) Saddle support (Ring type)</p>	4
2	e	<p><b>Globe Valve</b></p>  <p>(Nearly closed position)</p> <p>Valve plug or valve</p> <p>Stem</p> <p>Packing</p> <p>Body</p> <p>Fully open position</p>	4

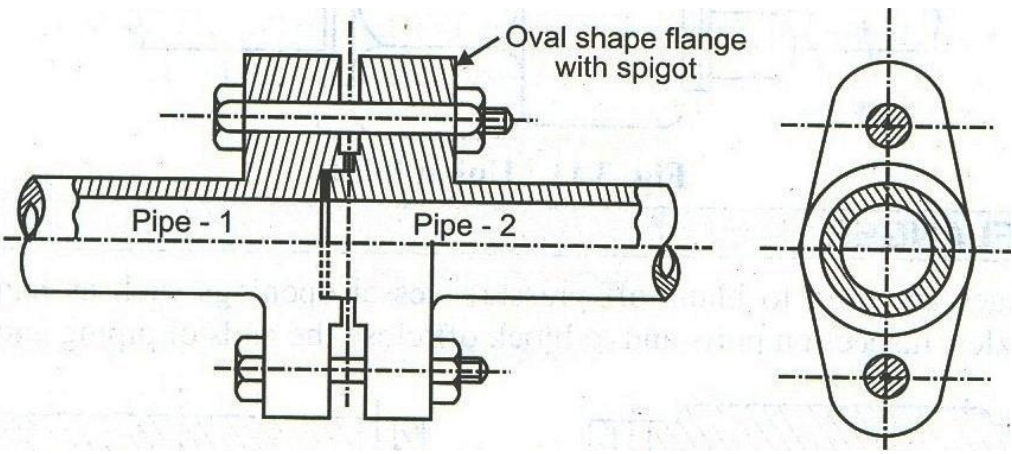
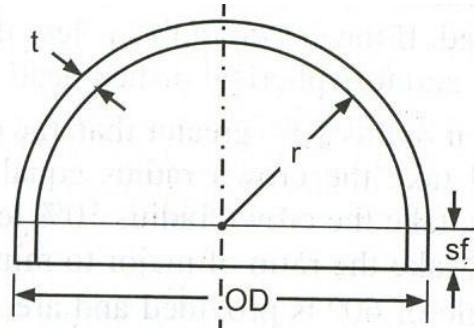
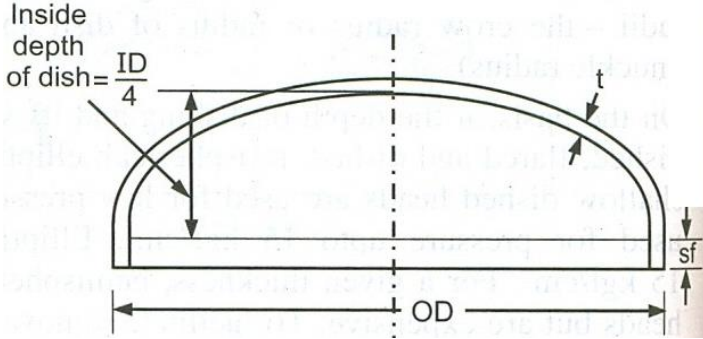
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2	f	<p><b>Hydraulic joint</b></p> 	4
3		<b>Attempt any four</b>	<b>16</b>
3	a	<p><b>Hemispherical Head</b></p>  <p><b>Elliptical dished head</b></p> 	2 marks each for any two





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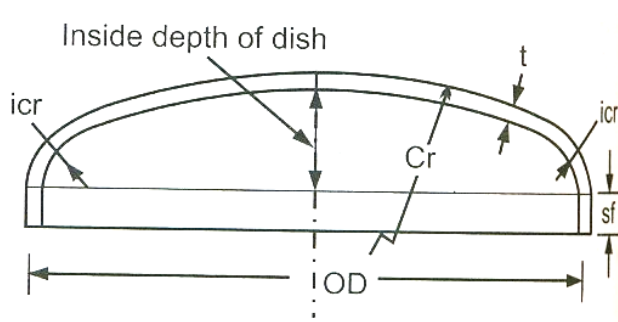
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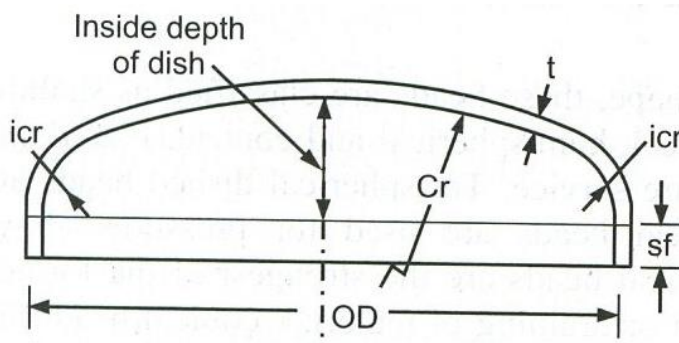
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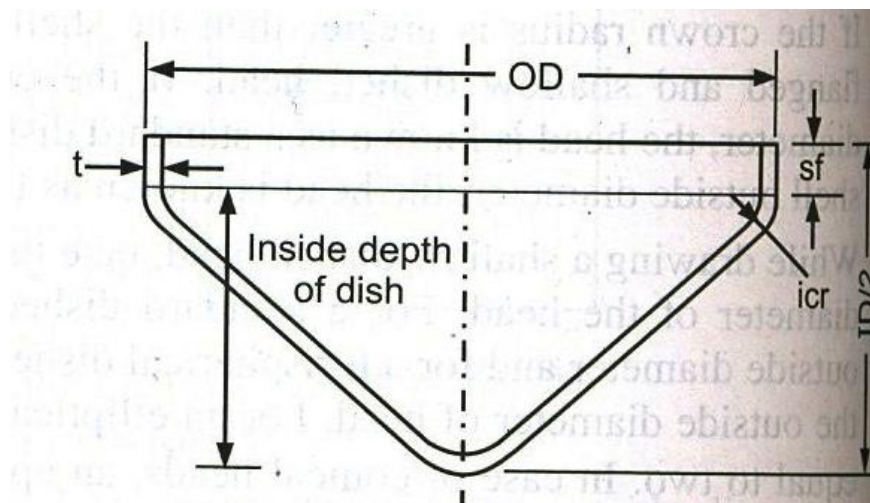
**Flanged and Standard dished head**



**Torispherical Dished head**



**Conical Head**





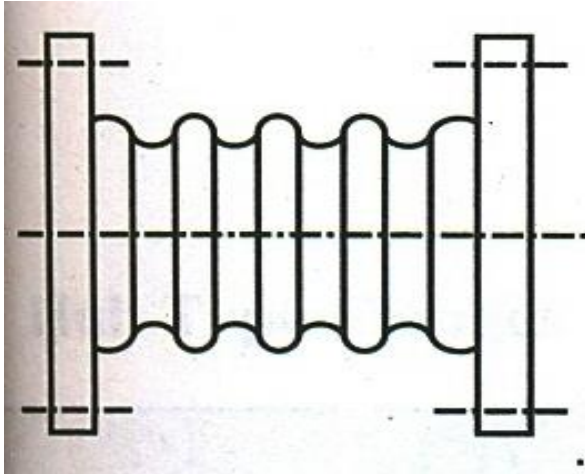
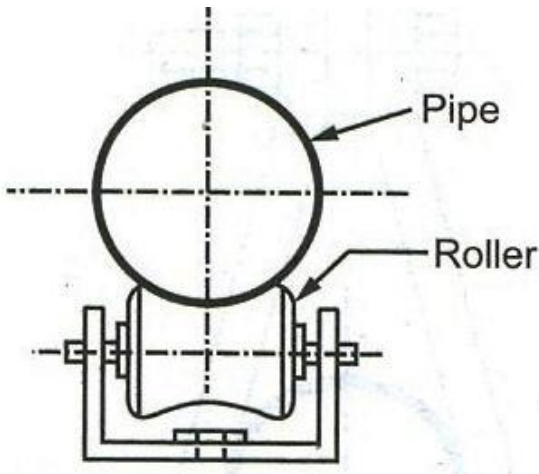
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3	b	<b>Corrugated joint</b> 	4
3	c	<b>Support for steam pipes</b> 	2 marks each for any two

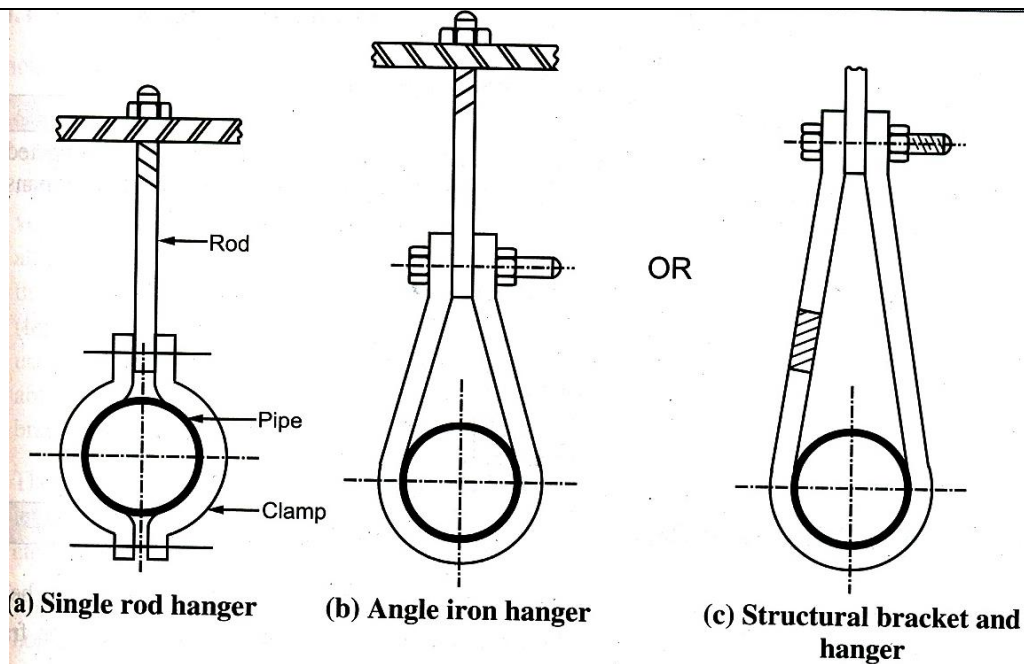
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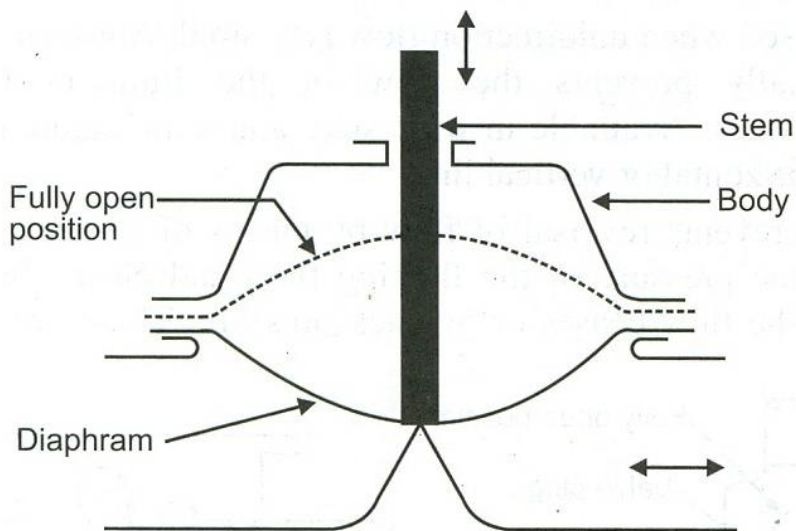
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3

d

Diaphragm valve



4



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3	e	<b>Ball valve</b>    <p>4</p>	
3	f	<b>Spring Loaded Safety Valve</b>    <p>4</p>	





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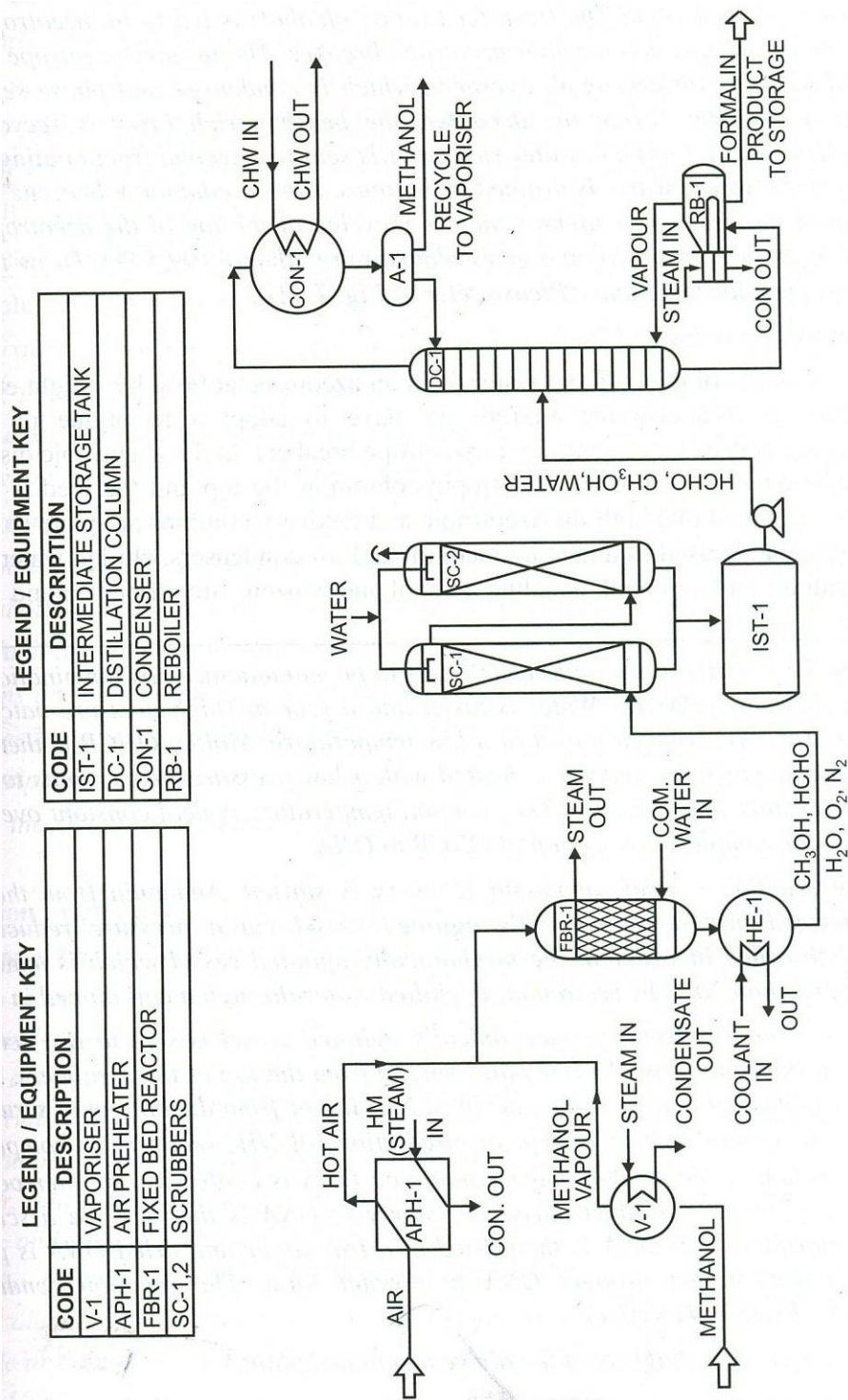
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4

Draw PFD- Production of methanol



16

(PFD 12  
marks +  
legend 4  
marks)



17647



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	b	Draw P&I diagram of distillation	8
6		Answer the following	16
6	a	Draw ELD of Q.4	Equipment layout 7 marks + legends 1 mark



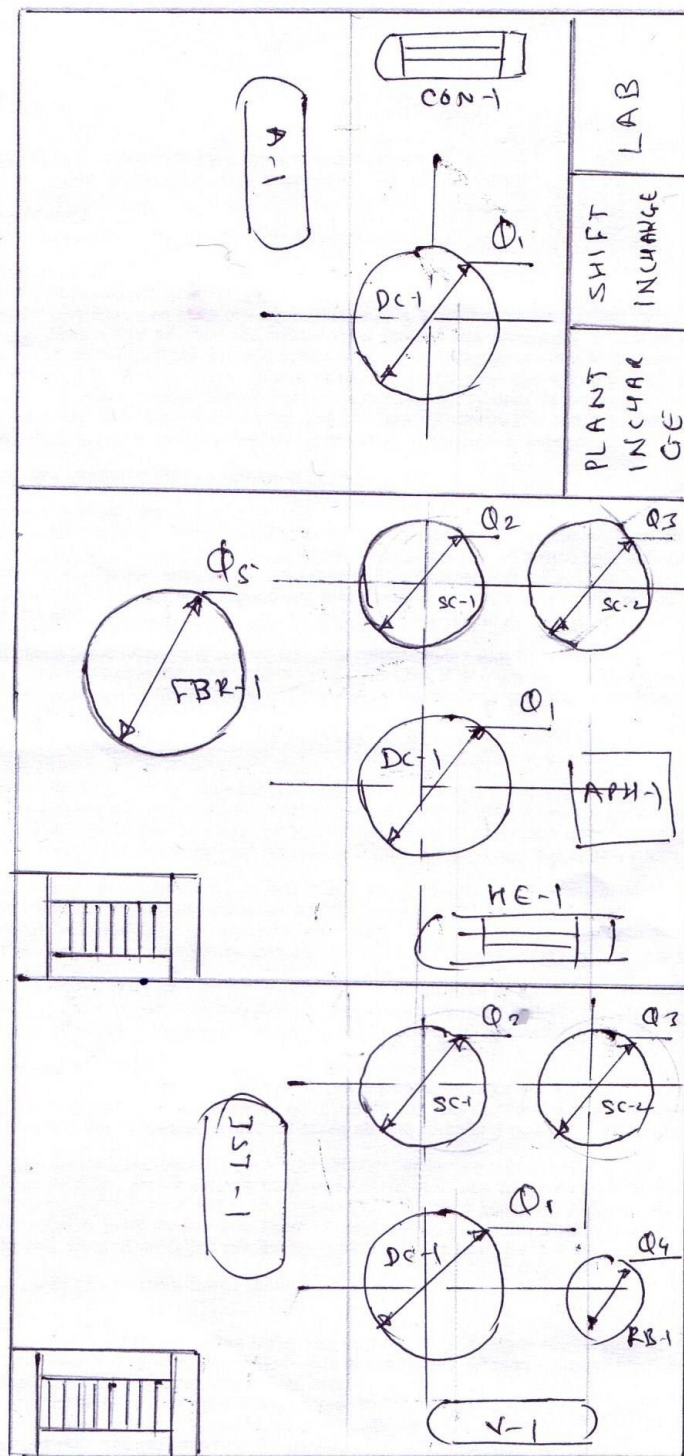
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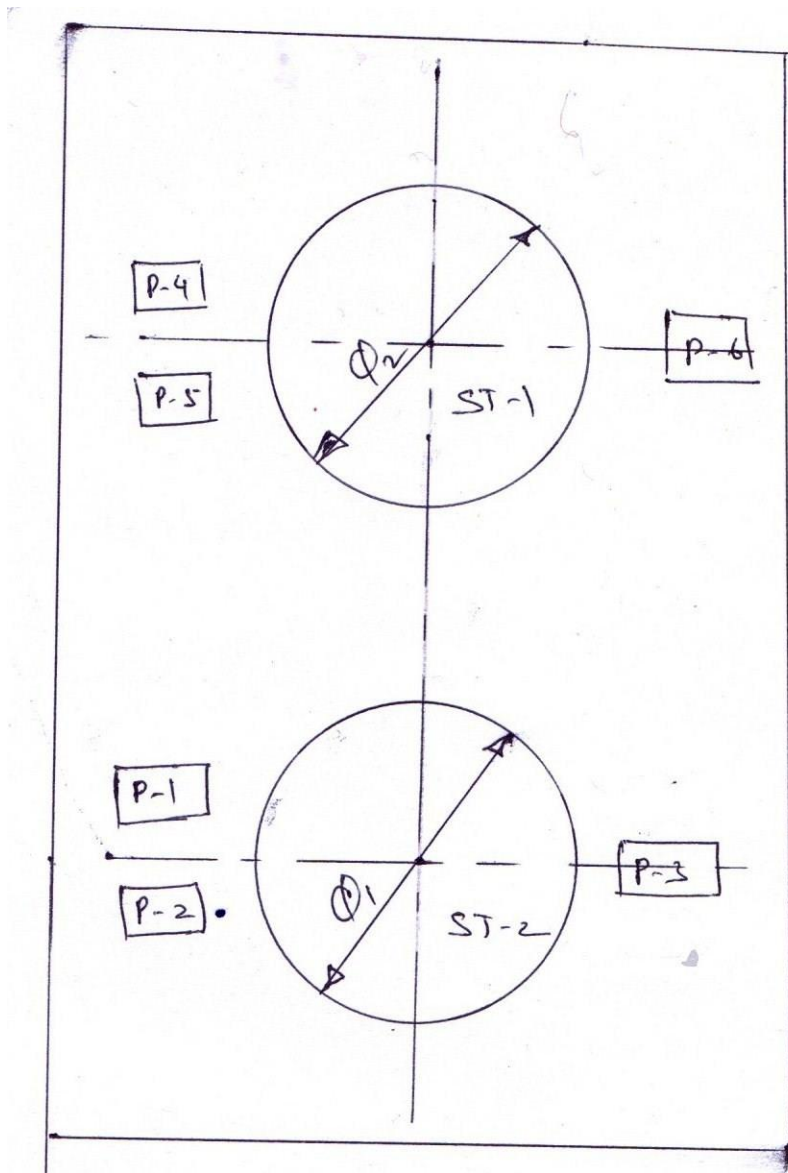
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b Draw tank farm for Q.4

Tank farm  
6+ legends  
2



ST1- Methanol Storage tank

ST2-Formalin storage tank

P1,P2,P3 – Methanol transfer pumps

P4,P5,P6 – Formalin transfer pumps