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DIPLOMAEXAMINATIONINENGINEERING/TECHNOLOGY /MANAGEMENT/COMMERCIALPRACTICE, APRIL– 2024

CIVIL EENGINEERING
ENTREPRENURSHIP AND STARTUP-ANSWER KEY

PART-A

. (9x1=9Marks)

1.	Innovation refers to the process of introducing new idea,methods,product or services.	1	1
2.	Innovation and Entrepreneurship Development Centre	1	1
3.	• Internet of Things (IoT) • Big Data and Analytics	0.5 X 2	1
4.	Social entrepreneurship is an approach by individuals, groups, start-up companies or entrepreneurs, in which they develop, fund and implement solutions to social, cultural, or environmental issues	1	1
5.	ODOI - One District One Idea	1	1
6.	Private Enterprises Public Enterprises	.5X2	1
7.	company shares are offered to investors so that they acquire a part of the business in exchange for capital	1	1
8.	A pitch deck is a presentation created to raise venture capital for your business	1	1
9.	Product validation is the process of evaluating a product during its development to ensure it meets specific requirements.	1	1

PART-B

(8x3=24Marks)

<table>
<tr><td>1.</td><td>
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<tr><th>ENTREPRENEUR</th><th>MANAGER</th></tr>
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Entrepreneur start a venture by setting up a new enterprise for his personal gratification
Entrepreneur is the owner of enterprises.he is his own boss
Entrepreneurs bear all risks and uncertainty involved in the enterprise.

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The main aim of manger is to render his service is an enterprise already setup by someone
Manager is the employee(servent) of the entrepreneur
Manager neither shares risk nor bear uncertainty

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</td><td>0.5x6</td><td>3</td></tr>
<tr><td>2
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<table>
<tr><th>B2B</th><th>B2C</th></tr>
<tr><td>B2B is business to business , where the transaction occur between business or companies</td><td>B2C is business to consumer, where the transaction occur between a business and a consumer</td></tr>
<tr><td>Several business or companies purchase product or services for their work related activities</td><td>Consumer often purchase product or services to satisfy their needs and wants</td></tr>
<tr><td>To provide other business with product and services related to their works</td><td>To provide product and services that satisfy human needs and wants</td></tr>
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</td><td>0.5 X 6</td><td>3</td></tr>
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3.	***<u>Success Factors:</u>*** ❏ **Innovation** ❏ **Access to Capital** ❏ **Talent Pool** ***<u>Failure Factors:</u>*** ❏ **Market Fit** ❏ **Financial Mismanagement** ❏ **Competition**	0.5 X 6	3
4.	1. Wealth without Work 2. Pleasure without Conscience 3. Knowledge without Character 4. Commerce without Morality 5. Science without Humanity 6. Worship without Sacrifice 7. Politics without Principle	0.5 X3	3
5.	● Focus Groups: A group of carefully selected participants discuss a specific topic or product under the guidance of a moderator. ● Surveys: Collect data from a larger sample of participants through standardized questionnaires. ● Consumer Research & Social Media Listening: Analyze conversations and reviews about your brand, competitors, and relevant topics on social media platforms	1x3	3
6.	The Business Model Canvas is a powerful tool for startups and established businesses alike to understand, visualize, and strategize their core operations. It helps you break down your business into nine key building blocks, providing a clear and concise picture of how you create, deliver, and capture value. 1. Customer Segments: Who are you serving? Clearly define your ideal customer base, considering demographics, needs, and behaviors. 2. Value Propositions: What problem do you solve for your customers? What unique value do you offer that sets you apart from competitors?	3	3

7.	**1. The Chief Executive Officer (CEO) & the Chief Operating Officer (COO):** The CEO and COO will be two of the most powerful players in your company. The CEO is the most visible position in the startup. The CEO is usually the person in charge of the company's overall long-term strategy, culture, and vision. **2. Chief technology officer (CTO) or VP Engineering** The CTO or VP of engineering team is the chief of all technical processes in the company. He establishes the tech strategy, tools and workflow for his teams. He also oversees a large portion of the hiring process for qualified technologists	1.5 x 2	3
8.	1. No Poverty 2. Zero Hunger 3. Good Health and Well-being 4. Quality Education 5. Gender Equality 6. Clean Water and Sanitation 7. Affordable and Clean Energy	.5x6	3

9.	A business exit strategy is an entrepreneur's strategic plan to sell his or her ownership in a company to investors or another company. An exit strategy gives a business owner a way to reduce or liquidate his stake in a business and, if the business is successful, make a substantial profit. If the business is not successful, an exit strategy (or "exit plan") enables the entrepreneur to limit losses. An exit strategy may also be used by an investor such as a venture capitalist in order to plan for a cash-out of an investment.	3	3
10.	In essence, the decision between "fail fast" and "succeed" is a strategic one that depends on the goals, risk tolerance, and context of the startup. Both approaches have their merits, and a nuanced understanding of when to iterate quickly and when to pursue success deliberately is crucial for building a resilient and successful business • Experiment Quickly • Learn from Feedback • Manage Risks • Adapt to Changes	3	3

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PART-C
(6x7=42Marks)

III.	**<u>The Kerala Startup Mission (KSUM)</u>** is the nodal agency established by the Government of Kerala in 2006 to catalyze and foster a robust startup ecosystem within the state. It serves as the central point of contact for startups, providing them with a comprehensive range of support and resources to help them thrive and achieve success. <u>Activities of KSUM:</u> 1. **Policy implementation**: 2. **Providing financial assistance**: 3. **Developing infrastructure**: 4. **Mentorship and networking**: <u>FUNCTIONS OF KSUM</u> 1. Providing financial assistance through grants, subsidies, and venture capital support. 2. Establishing and managing incubation centers, co-working spaces, and innovation labs. 3. Connecting startups with mentors, investors, and industry experts. 4. Organizing workshops, training programs, and bootcamps. 5. Promoting specific sectors like IT, biotechnology, healthcare, and tourism. **OR**	2+2+3	7
IV	1. **Risk-Taking Propensity**: Entrepreneurs are willing to take calculated risks to pursue opportunities, even in the face of uncertainty. 2. **Innovative Thinking:** Entrepreneurs are known for their ability to think creatively and introduce new ideas or solutions to problems. 3. **Vision and Planning**: Successful entrepreneurs have a clear vision for their ventures and develop strategic plans to achieve their goals. 4. **Adaptability:** Entrepreneurs are adaptable and can navigate through changes and challenges in the dynamic business environment. 5. **Proactiveness:** Entrepreneurs are proactive in identifying opportunities, making decisions, and taking the initiative to achieve	1 x 7	7

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<tr><td>V</td><td>their objectives.
6. Persistence: Entrepreneurial ventures often face obstacles, and persistence is crucial for overcoming challenges and ensuring long-term success.
7. Customer Focus: Entrepreneurs understand the importance of meeting customer needs and continuously seek ways to add value to their offerings.

<u>STEPS IN PROBLEM IDENTIFICATION</u>

1. Observation:

Observation is the initial step in problem identification, involving keenly observing the environment, processes, or systems to identify potential issues.

2. Feedback:

Feedback involves gathering input from stakeholders, users, or individuals directly affected by a particular situation. Their insights provide valuable perspectives on existing problems.

3. Data Analysis:
Data analysis involves systematically examining data to identify patterns, trends, or anomalies that may indicate underlying problems

4. Brainstorming Sessions:
Brainstorming sessions are creative group activities where participants generate a wide range of ideas to address identified problems</td><td>1 x 7</td><td>7</td></tr>
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	5. SWOT Analysis: SWOT analysis assesses the Strengths, Weaknesses, Opportunities, and Threats associated with a particular situation, helping to identify internal and external factors that contribute to or hinder a problem. **6.** Market Research:Market research involves gathering information about the target market, competition, and industry trends to understand the broader context in which the identified problem exists. **OR**		
VI.	**DESIGN THINKING** Design thinking is an iterative, non-linear process which focuses on a collaboration between designers and users. It brings innovative solutions to life based on how real users think, feel and behaveThe goal of the design thinking process is to come up with solutions, products, or services that are desirable for the user, economically viable from a business perspective, and technologically feasible The Five Stages of Design Thinking: **Stage 1: Empathize—Research Users' Needs** The team aims to understand the problem, typically through user research. Empathy is crucial to design thinking because it allows designers to set aside your assumptions about the world and gain insight into users and their needs. **Stage 2: Define—State Users' Needs and Problems** Once the team accumulates the information, they analyze the observations and synthesize them to define the core problems. These definitions are called **problem statements**. The team may create **personas** to help keep efforts human-centered. **Stage 3: Ideate—Challenge Assumptions and Create Ideas** With the foundation ready, teams gear up to “think outside the box.” They brainstorm alternative ways to view the problem and identify innovative solutions to the problem statement. **Stage 4: Prototype—Start to Create Solutions**	2+5	7

	This is an experimental phase. The aim is to identify the best possible solution for each problem. The team produces inexpensive, scaled-down versions of the product (or specific features found within the product) to investigate the ideas. This may be as simple as **paper prototypes**. Stage 5: Test—Try the Solutions Out The team tests these prototypes with real users to evaluate if they solve the problem. The test might throw up new insights, based on which the team might refine the prototype or even go back to the Define stage to revisit the problem.		
VII.	**Organization Structure of Startup** The organization structure of a startup can vary based on factors such as its size, industry, and specific goals. However, many startups tend to adopt structures that emphasize flexibility, innovation, and rapid decision-making. Here's a common classification of the organization structure of a startup Flat Organizational Structure: In a flat structure, there are few or no layers of middle management between the staff and the top executives. The organization has a wide span of control, and communication channels are usually short. Functional Structure: This structure organizes employees based on their functional areas, such as marketing, engineering, finance, etc. Each department is headed by a functional manager, and employees report to both the functional manager and the startup's overall leader. Matrix Structure: The matrix structure combines elements of both functional and project-based structures. Employees report to both functional managers and project managers, leading to a dual reporting relationship. **OR**	1+(2X3)	7

VIII	**Investor pitching** refers to the process of presenting a business idea, startup, or investment opportunity to potential investors with the goal of securing funding or financial support. - The pitch is often delivered in the form of a presentation or a speech, accompanied by visual aids such as a pitch deck. It is a strategic communication effort aimed at convincing investors to invest capital in the business. - Investor pitching is a fundamental aspect of fundraising, and the effectiveness of the pitch can significantly impact the success of securing investment. components of an investor pitch **Introduction:** Briefly introducing the presenter and providing context for the pitch. **Problem Statement:** Clearly defining the problem or need in the market that the business aims to address. **Solution:** Presenting the product or service offered by the business as a solution to the identified problem. **Market Opportunity:** Describing the size and potential of the target market, showcasing the business's growth potential. **Business Model:** Explaining how the company plans to generate revenue and sustain itself financially. **Traction:** Highlighting any achievements, milestones, or evidence of market interest in the business. **Competitive Landscape:** Identifying competitors and explaining the competitive advantages of the business.	5+2	7

IX	**Bootstrapping** Bootstrapping is when an entrepreneur starts a company with personal savings, including borrowed or invested funds from FFF and income from initial sales. Self funded businesses do not rely on the support of investors, public funds, crowd funding or bank loans. Rather, entrepreneurs must "pull themselves up by their bootstraps" using their capital to launch. **2.FFF** Every year, 35-40% of startups receive capital from friends and family. The wellknown "Friends, Family and Fools" is, normally, the first source of financing that every company turns to in its beginnings. This form of financing uses the savings of the entrepreneur and the help of family and friends who trust the business project they are working on. **3.Seed Funding** Also known as seed financing, company shares are offered to investors so that they acquire a part of the business in exchange for capital. Apart from the FFF, seed capital comes from Angel investors and crowdfunding. **5.Crowd funding** Crowd funding is one of the most popular forms of financing companies, startups and projects contributing to the common good. The term can be broken down into two terms, crowd + funding. In such type of funding, you reach out to a crowd who can collectively provide the necessary amount to fund your venture. **OR**	7	7
X	**Patent Registration** is a legal process which grants exclusive rights of ownership and usership to the inventor of a product, service, or technology. The Patent Registration process is extremely crucial for inventors and businesses to protect their innovative ideas and prevent others from using, selling, or manufacturing their inventions without permission or authorization. **PROCEDURE FOR PATENT REGISTRATION IN INDIA** **Step 1: Patent Search** **Step 2: Drafting Patent Specification**	3+4	7

	Step 3: Patent Application Filing **Step 4: Patent Publication for Public Opposition** **Step 5: Requesting Patent Examination** **Step 6: Grant of a Patent**	2x3.5	7
XI	**“Industry 4.0”** refers to the fourth industrial revolution and represents the ongoing automation and digitization of manufacturing processes.It incorporates various advanced technologies to create what is often referred to as the "smart factory." **9 Pillars in Industry 4.0** 1. Internet of Things (IoT): Description: IoT plays a central role in Industry 4.0 by connecting physical devices and machinery to the internet. This connectivity allows for data collection, analysis, and remote monitoring, optimizing operational efficiency. 2. Big Data and Analytics: The use of big data analytics enables the processing and analysis of large volumes of data generated by various sources in the manufacturing process. Insights gained from data analytics inform decision-making, predictive maintenance, and process optimization. 3. Artificial Intelligence (AI) and Machine Learning:AI and machine learning algorithms are employed to analyze data patterns, predict outcomes, and optimize processes. This includes applications like predictive maintenance, quality control, and demand forecasting. 4. Advanced Robotics: Advanced robotics are utilized for tasks ranging from repetitive assembly line processes to complex manufacturing operations. Collaborative robots, or cobots, work alongside human workers, enhancing efficiency and safety. 5. Cyber-Physical Systems (CPS):CPS refers to the integration of physical processes with digital systems. It involves the use of sensors, actuators, and communication technologies to monitor and control physical processes in real-time. 6. Additive Manufacturing (3D Printing):3D printing is a key component of Industry 4.0, allowing for the rapid prototyping and production of complex components. It offers greater design flexibility and efficiency in the manufacturing process.	1+6	7

	7. Augmented Reality (AR) and Virtual Reality (VR): AR and VR technologies enhance training, maintenance, and design processes. They provide immersive experiences, aiding in visualizing complex systems and guiding workers through tasks.		
XII.	**<u>INNOVATION AND ENTREPRENEURSHIP DEVELOPMENT CENTRE(IEDC)</u>** The Innovation and Entrepreneurship Development Centre (IEDC) is a government-funded initiative established in various educational institutions across India. Its primary mission is to foster a culture of innovation and entrepreneurship among students and faculty, equipping them with the necessary skills and resources to launch their own ventures. 1. Create awareness about entrepreneurship 2. Nurture entrepreneurial skills 3. Promote innovation 4. Connect students with stakeholders **<u>KERALA TECHNOLOGY INNOVATION ZONE (KTIZ)</u>** The Kerala Technology Innovation Zone (KTIZ) is a 13.2-acre campus established by the Kerala government in Kalamassery, Kochi. Its mission is to foster a vibrant ecosystem for technology innovation and entrepreneurship in the state. Incubators: KTIZ houses several incubators that support startups across various sectors, including IT, healthcare, electronics, and social impact. These incubators provide startups with workspace, mentorship, networking opportunities, and access to funding. A Fab Lab, or digital fabrication laboratory, is a place to play,create to mentor and to invent: a place for learning and innovation. **<u>Fab Labs</u>** provide access to the environment, the skills, the materials and the advanced technology to allow anyone anywhere to make (almost) anything.Fab Lab - Digital Fabrication Laboratory, is a place where anyone can make (almost) anything, using digital design, 3D printers, laser cutting and other advanced technological means.	(2.5 X2)+2	7

XIII.	<u>**Business Exit Strategy**</u> A business exit strategy is an entrepreneur strategic plan to sell his or her ownership in a company to investors or another company. An exit strategy gives a business owner a way to reduce or liquidate his stake in a business and, if the business is successful, make a substantial profit. If the business is not successful, an exit strategy (or "exit plan") enables the entrepreneur to limit losses. **Initial Public Offering (IPO)** In an IPO exit, you are taking your business to the public and selling shares as stock to shareholders. While an IPO has the potential to be extremely lucrative, it is also extremely challenging. While private investors could see huge potential in your business, the wider industry may not. High regulatory costs and added pressure and scrutiny from shareholders are often enough to make many opt to stay private. **Liquidation** This is a common exit strategy for failing businesses. Liquidation is one of the most final exit strategies, whereby the business is closed down and all assets sold off. Any cash earned must go toward paying off debts and shareholders (if there are any). **Management and employee buyouts** In management buyouts, those already working within the business are able to transition into more senior roles to fill the gap in leadership. As the management team is already familiar with your business, they should be well equipped to manage the company. **OR**	1+(2x3)	7
XIV.	<u>**STRATEGIES TO VALIDATE A PRODUCT IDEA**</u> <u>**1. Make some sales**</u> Making a few sales is the first and arguably best way to validate your product.There is nothing more important than customers seeing your product's value and exchanging money for it. <u>**2. Conduct a competitor analysis**</u> Research is useful when you're still in the ideation stage or seeking products to sell. Before investing too much time and money into your idea, you can mitigate risk and build confidence in your idea by exploring the current market. <u>**3. Research existing demand**</u> Analyzing demand and search volume is another way to validate your product.Now that you know more	1.5 X 5	7

	about your competitors, let’s look at potential customers' interest. **4. Start a crowdfunding campaign** A crowdfunding campaign is a helpful, proven option to see if there’s demand for your product. One of the benefits of a crowdfunding campaign is that you have a firm timeline, and it requires all of your focus and effort to reach your goal. **5. Gauge interest on social media** Another way you can validate a product idea is through social media. Your followers know you best and will tell you what they want to see from you.		